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**Reference:** 1. New York State J. Med. 50:2293, 1950.

# California M E D I C I N E

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## Acute Myocardial Infarction

### A Discussion of Certain Controversial Issues

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THE DETAILS IN MANAGEMENT of patients with acute myocardial infarction have been promulgated more exactly and stereotyped to a greater degree than the variations of the actual illness should allow. The controversial issues which are to be mentioned are often quantitative rather than qualitative, and it is important to recognize that the best treatment in one geographic location may not necessarily be the best in another.

Some of the problems that are in dispute, some with vehemence, are as follows: (1) classification of the severity of the attack at the time of the initial examination; (2) whether hospitalization or home care is better; (3) the type of rest and the length of time that the patient should be restricted to his bed or room; (4) the indications for anticoagulant therapy; (5) the indications for oxygen therapy; (6) the indications for use of pressor drugs, such as norepinephrine; (7) the indications, if any, for transfusion and (8) the indications for use of special medication, such as atropine, papaverine, aminophylline, procaine amide hydrochloride (Pronestyl), quinidine and digitalis.

Each one of these issues could be debated at some length but this presentation will deal mainly with the present controversies concerning the period of

• As a general rule, it is not believed possible to classify patients with acute myocardial infarction as to the future severity of their illness at the time of the initial examination. However, classifications are possible from complete clinical data of the first few days with regard to the predicted mortality rates. Whether to manage the patient in the hospital or at home depends on the community facilities. The patient should be in bed for a period of two to three weeks if unquestioned infarction has occurred.

The main avenue of investigation as to lowering of mortality needs to be directed toward the prevention of heart failure or sudden unexpected death probably related to arrhythmia. If the patient is hospitalized and laboratory facilities are available, anticoagulant therapy can be safely and effectively carried out without undue risk or prohibitive increase in the cost of management. The experience of the author and his colleagues has led to the belief that anticoagulants given routinely to patients with myocardial infarction are effective in decreasing the incidence of thromboembolic complications.

rest and the anticoagulant program. Some of the difficulty that has arisen concerning these two factors has been due to lack of specific objectives in

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the treatment of acute myocardial infarction, lack of recognition of the natural variations of the disease, and the limitations in modifying it.

First on the agenda, then, should be reconsideration of the major goals in the management of acute myocardial infarction and examination of each objective in the light of any possible beneficial modification by specific medication or measures. Some of the basic problems to be outlined may appear to some readers as trite and so simple as to have been accepted as obvious. However, they need to be considered anew in the light of present-day advances. The first objective of treatment of acute myocardial infarction is to prevent death; for this it is necessary to know the types of death in acute attacks. The second aim is to prevent prolongation of the illness; for this it is necessary to know the nature and incidence of complications. The third objective is to assure the least possible residual cardiac damage after recovery; for this it is necessary to know the course of patients who have recovered. The fourth goal, a corollary to the third, is to insure the best chance of the patient's being employable or being happy in retirement; for this it is necessary to know the follow-up results in a large series of patients and the exact details of their illness and management.

#### *Deaths in the Acute Attack or Ultimate Fate of Patients*

From a recent study<sup>10</sup> of deaths from acute myocardial infarction in cases in which postmortem examinations were carried out, it was found that approximately half of the patients died with the clinical picture of heart failure. "Sudden death"—that is, unexpected and without premonitory distressing symptoms or any pathologic condition to explain it exactly—occurred in approximately a quarter of the cases. Rupture of the heart occurred in 15 per cent of the cases and thromboembolic phenomena were the main cause of death in six per cent. The nature of the heart failure, when present, could be roughly classed into the various types depending on whether the evidence of systemic venous pressure or pulmonary congestion was more pronounced. Thus, predominant right heart failure had been present in a third of these cases, predominant left heart failure in a third, and combined heart failure in a third.

The ultimate fate of persons who have recovered from one acute myocardial infarction also has been analyzed.<sup>1</sup> A series of 250 such patients has been studied; nearly a third of them died from primarily non-cardiac conditions. It is possible, however, that the cardiac lesion may have contributed to their end. In those who died primarily of heart disease, the essential problems were those of congestive

heart failure, sudden (that is, relatively unexpected) death or death from recurrent acute infarction.

Hence it may be observed that two of the main problems in the treatment of the acute attack are related to the inadequacy of the measures that are available for the prevention of heart failure or sudden death.

Closely related is the problem that has faced the medical profession since the introduction of anticoagulant therapy. This is the proper evaluation of the importance of thromboembolic complications in the fatal cases. In the first studies from the Mayo Clinic<sup>13</sup> on this problem thromboembolism seemed to have a significant influence on the mortality rate. In a recent study<sup>1</sup> it was noted that thromboembolism accounted for six per cent of the death from acute myocardial infarction. All the patients in this group who died of thromboembolism either had received no Dicumarol (dicoumarin) because they were admitted to the clinic late after infarction or because they came from a mental hospital where the infarction was not recognized, or had received Dicumarol for less than two days.

#### *Hospital or Home Care and Rest*

Of the general problems in care of the patients with acute myocardial infarction, the first to arise is: Should patients with myocardial infarction be treated at home or in the hospital? It is my belief that either program may be acceptable, one or the other method being the more preferable in individual communities. It is important to emphasize that the prognosis cannot be adequately estimated when the patient is seen in the first hours of pain. In the community in which the author practices, practically all patients are treated in the hospital, and there seems to be no real danger in transporting them short distances to the hospital. This practice of early hospitalization undoubtedly facilitates the anticoagulant program. Hospitalization might be said to be not only convenient to physicians but to permit them to direct the management of a larger number of patients. While economically hospitalization of patients would appear less desirable than rest at home, balancing factors to be considered are the availability of nursing care in the hospital and the fact that the patient's course can be followed much more closely and more time spent with him in discussion of his problem after the acute distress has disappeared. The period I recommend varies greatly from three to five weeks, depending on the presence or absence of complications and the home environment to which the patient will return. If a hospital that is well staffed with nurses and residents is not not available, then in many cases it is preferable to treat patients in their homes, particularly if the home environment is more conducive to rest and relaxa-



tion (perhaps through such factors as air conditioning) than the hospital. Many patients undoubtedly feel better and convalesce more satisfactorily away from the family, but others do not.

The objective of rest in the management of acute myocardial infarction should always be relaxation and protection against environmental stresses, both physical and psychic, and not simply rigid confinement to bed. For many years no patient in a Rochester hospital has had to struggle with a bed pan. If patients have difficulty using the pan while reclining they are permitted to sit up on the side of the bed or use a bedside commode. Patients have always been permitted to have their beds elevated to the most comfortable position and to feed themselves.

The abuse of rest in bed has been well outlined, but the pendulum has swung too far away from it in my opinion, which is based on appraisal of reports such as that of Levine and Lown<sup>9</sup> on "Armchair Treatment of Coronary Thrombosis." These authors emphasized that careful early ambulation has had no ill effects. When they stated that traditionally patients were placed *flat* in bed for three to six weeks, it is perhaps overstating the degree of restrictions that are applied generally in practice. The armchair per se offers no advantage with regard to morale as compared with a good general attitude on the part of the attending physician and the nurses.

After the first ten to fourteen days of rest in bed if everything has gone smoothly, I like to discuss with the patient the unit area program, or the expanding microcosmos. I emphasize that he is first in bed, then in the environs of the bed, including the chair, then in the room and an adjoining bathroom, and gradually is able to take expansion into the world in general.

One problem that concerns me greatly is that I do not know what happens to patients who do not receive any of the traditional methods of therapy, except that many seem to get along exceptionally well. In a recent study of cardiac aneurysms, Phares, Edwards and I<sup>15</sup> found, as others have also, that less than a quarter of the patients had a period of rest during the acute attack. Whether or not any peculiar selection of the cases would render any conclusion from these figures void is conjectural. It is to be remembered that cardiac aneurysm is not necessarily associated with a short life, and exercise did not have a detrimental effect on the survival of rats with myocardial infarction resulting from ligated coronary arteries.<sup>22</sup>

Although the title of the article by Levine and Lown implies that the diagnosis of coronary thrombosis can be made, it is well known that a better diagnosis is myocardial infarction. The figures which my colleagues and I<sup>11</sup> collected are similar to those

of others and indicate that in approximately two-thirds of the patients who have acute myocardial infarction an acute coronary occlusion is the cause of the infarction and in one-third there is no acute occlusion, only narrowed coronary vessels.

### *Problems of Anticoagulant Therapy*

To return now to the problem of thromboembolism in acute myocardial infarction: In 16 per cent of a series of 210 fatal cases of acute myocardial infarction in which postmortem examinations were performed, Miller, Jordan, Parker and Edwards<sup>12</sup> found pulmonary emboli. Of the patients who had pulmonary emboli, one-third had shown no clinical evidence of congestive failure and two-thirds had clinically evident congestive failure. In 23 per cent of these same 210 cases (studied from the old tissue before anticoagulants had been utilized) systemic emboli<sup>8</sup> were found. Systemic emboli were about twice as common in cases in which mural thrombi were demonstrable as in those in which thrombi were absent, about twice as common when heart failure was present as when it was absent, and they were held to be the immediate cause of death in approximately four per cent of cases. Such figures indicate that thromboembolism was definitely a problem in patients who died from acute myocardial infarction and give further evidence that anticoagulant therapy was one avenue of attack that might lower the incidence of death.

The objectives of an anticoagulant program are as follows:

1. Anticoagulant therapy may be used to prevent mural thrombi and systemic emboli. This may be a possible effect of anticoagulant therapy but it is now known that mural thrombi may be present in patients who have been treated with Dicumarol. Perhaps such thrombi originated before the therapy was started; perhaps not. That anticoagulants have decreased the number of systemic emboli displaced from the left ventricle seems very probable.

2. It may be used to prevent the progression of a thrombotic lesion in a coronary vessel. Although this effect has been considered possible, there has never been any pathologic proof that progressive longitudinal thrombosis often occurs in the coronary artery. It is obvious, therefore, that anticoagulants could have little or no demonstrable effect here. However, this is not a universally held opinion.

3. It may be used to prevent pulmonary embolism. If episodes of nonfatal pulmonary emboli were prevented, one factor that could contribute to heart failure might be removed. There is a probable but not established effect here. It seems definite, however, that fatal pulmonary embolic episodes may be prevented.

4. To these possible uses of anticoagulant therapy should be added their use to exert the beneficial properties of the anticoagulants not related to the anticoagulant effect per se, that is, coronary vasodilatation or thrombus lysis. There is, however, as far as I know, only suggestive evidence of such effects in human beings.

As to the prevention of pulmonary embolism, an anticoagulant program has a real chance of success. As a comparative problem, it is of interest that of a large series of postoperative patients who were thought to have a higher potentiality for the development of this complication, none had fatal pulmonary embolism<sup>3</sup> after use of anticoagulants. In 352 cases of postoperative venous thrombosis that were treated by Dicumarol, not a single fatal pulmonary embolus occurred. On the basis of past experience, 20 deaths might have been expected had anticoagulants not been used. Of 329 patients with nonfatal pulmonary emboli treated by anticoagulants, one died of pulmonary embolism after the prothrombin time had returned to normal. On the basis of past experience, 60 deaths from pulmonary emboli might have been expected had anticoagulants not been used.

In the initial survey of the effect of Dicumarol carried out by Parker and Barker<sup>14</sup> at the Mayo Clinic, the incidence of pulmonary embolism and of fatalities was found to be decreased. The American Heart Association Committee for Evaluation of Anticoagulants in Treatment<sup>23</sup> reported that its study showed beyond doubt a decrease in death rate and in thromboembolic complications in the treated group. The significance of the figures obtained by the committee in respect to possibilities of selection and interpretation have met with much discussion, including editorial comment.<sup>6, 17, 19</sup> It is well to point out that in studies made at the Mayo Clinic by my colleagues and me, prevention of fatal pulmonary embolism by use of anticoagulant therapy was thought worth while, even though it might prevent only one out of twenty expected deaths, or save one patient in a hundred with acute myocardial infarction.

Since criticism has been directed at the routine use of anticoagulants in myocardial infarction, careful study of the objections to it is important. Some of these objections are real indeed and are due to hazards which should not be overlooked by any physician embarking on the program.

The possibility of general hemorrhagic complications of significance cannot be disregarded, particularly in the case of patients who have associated liver disease or peptic ulcer or are aged and in a poor nutritional state. I think, now, that in years past peptic ulcer has been overemphasized as an absolute contraindication to anticoagulant therapy, and that in the absence of recent established bleeding, anticoagulant therapy may be administered.

In general, patients with acute myocardial infarction who have been treated with Dicumarol have been more easily managed than postoperative patients, as the danger of bleeding is so much less. In the past five years, however, in our group no death from hemorrhage has occurred after operations.<sup>2</sup> Besides the dangers in general of bleeding, the possible and theoretic cardiac dangers of anticoagulant therapy that have been mentioned are: (1) increased likelihood of myocardial rupture, (2) development of hemorrhagic pericarditis or (3) bleeding into walls of the atheroma in the coronary vessel. The incidence of myocardial rupture in our fatal cases has been between ten and fifteen per cent over the years and has not increased since anticoagulants have been used. We have been concerned because we have seen hemorrhagic pericarditis<sup>4</sup> in two cases, but we also have seen this in one case in which anticoagulants were not employed.

Another objection to anticoagulant therapy is the serious accusation that the usual program is ineffective, due, as Schnur<sup>21</sup> claimed, to "the universal difficulty of maintaining constantly effective prothrombin blood levels." Some published results indicate that the program in some centers may have been ineffective. Incidentally, even after ten years of use of anticoagulant therapy at the Mayo Clinic, we cannot come to a definite and exact conclusion as to the optimal and minimal effective levels of prothrombin activity or as to whether intermittent therapy could be of value as well as continuous therapy.

Without question anticoagulant therapy is less easy when the patient is treated at home or in a small hospital, but it is still quite practicable. It is obvious also that this program adds to the cost of therapy both directly and indirectly. But this seems a minor problem. The cost of Dicumarol itself is small, which is one important reason Dicumarol is preferred over heparin. Ethyl biscoumacetate (Tromexan) is approximately seven times as expensive as Dicumarol but I usually give it on the first day of anticoagulant therapy in a dose of 1,200 to 1,500 mg. along with the initial dose of 200 to 300 mg. of Dicumarol. In general, it has seemed best to use in practice the anticoagulant with which one has had the greatest experience. Investigations<sup>20</sup> have indicated that Dicumarol and Tromexan may have equal efficacy in the prevention of thromboembolic complications but I cannot concur that the latter has been established as a better and safer drug.

Some of the articles criticizing the anticoagulant program have approached it from the statistician's point of view. Others are worded like lawyer's briefs, as if in defense of those physicians who might not use it or resent a central authority's exerting pressure on them in methods of practice. Still others

approach the problem carefully to try to evaluate the general applicability of the method in clinical practice. Russek and associates,<sup>16, 18</sup> Furman and associates<sup>7</sup> and Schnur<sup>21</sup> have spent considerable effort attempting properly to evaluate this method of therapy; they have attacked particularly the idea of routine use as against selected use. The aim of such studies is creditable indeed. Of some interest are the replies from a group of physicians that Russek and Zohman<sup>16</sup> published. Half of the physicians who replied said they used it routinely, and the drug was used, either routinely or with clinical selection, by 90 per cent of those who answered.

In order to obtain some data on whether anticoagulant therapy decreased prothrombin activity adequately, I asked Berkson of our statistical section to go over the records of all the patients with myocardial infarction who had been given anticoagulants in a single year (1951) and to chart the prothrombin time after the first 48 hours (Chart 1). The actual distribution of prothrombin times shows that, of the approximately 1,000 observations, less than ten per cent were in the ineffective range and less than five per cent in what has been defined arbitrarily as the potentially dangerous range. None of the patients in this group had a hemorrhagic complication. I believe that this is satisfactory but that we can do better.

In our laboratory a prothrombin time of 60 seconds is indicative of prothrombin activity of 10 per cent of normal; 35 seconds, 20 per cent of normal;

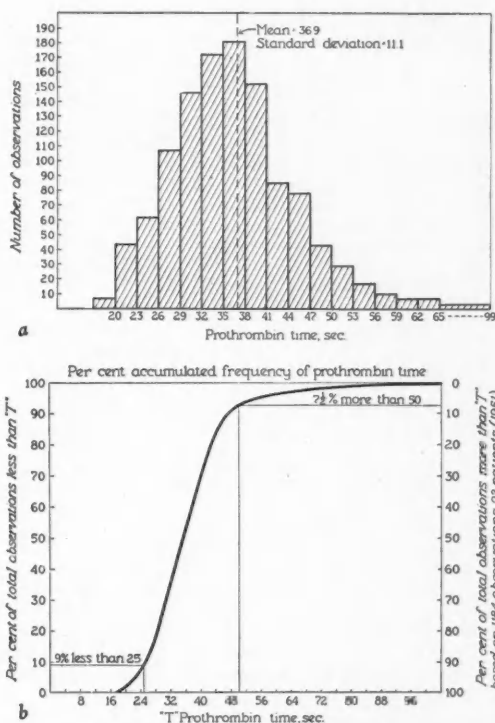


Chart 1.—(a) Distribution of prothrombin times in 92 consecutive patients treated with Dicumarol (omitting first two days of treatment). (b) Same data as in (a) charted as an accumulated frequency curve.

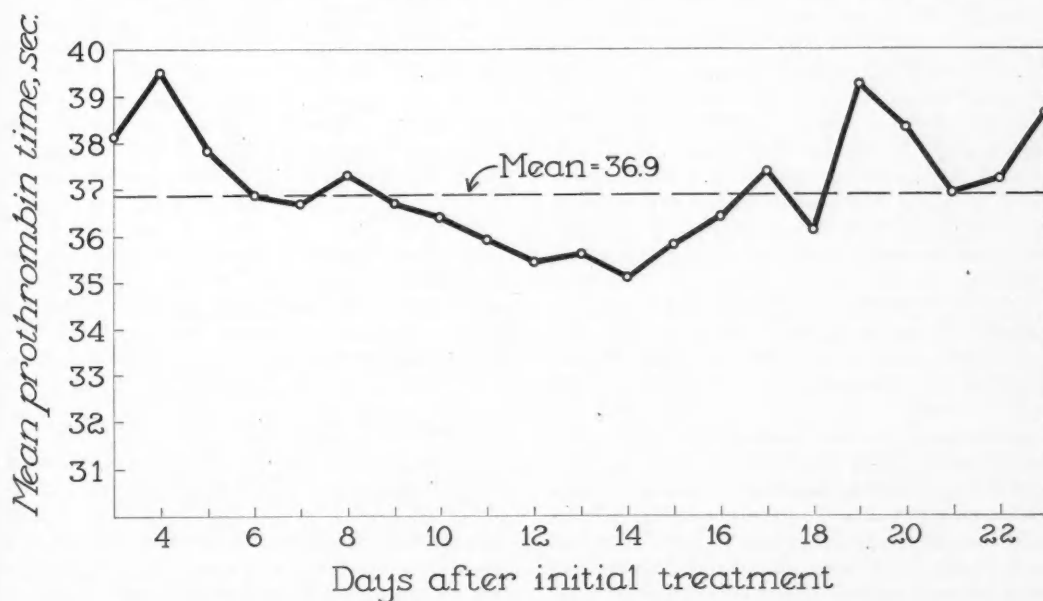


Chart 2.—Mean prothrombin times of the 92 patients with acute myocardial infarction treated with Dicumarol on the various days of their illness, 1951.

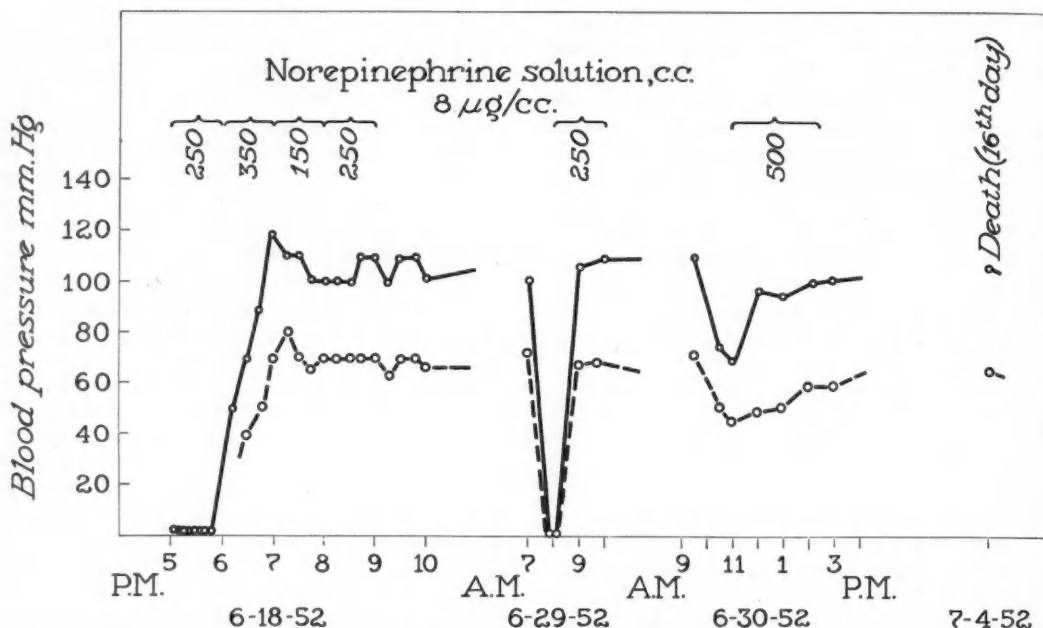


Chart 3.—Blood pressure response to norepinephrine in case described in text. The maintenance of a good urinary volume is of particular importance as well as the response in blood pressure and general condition of the patient.

27 seconds, 30 per cent of normal. Our arbitrary goal is to maintain the prothrombin time between 27 and 60 seconds or a prothrombin activity between 10 and 30 per cent of normal. The average or mean patient of the group of 92 was well treated (Chart 2). The ease with which an anticoagulant program is controlled will be directly related to the intelligence and experience of the resident physicians. It usually is related also to a simple concept that, when Dicumarol is being given, the physician has to think 48 hours ahead with regard to the effect of the dose and arrange the dose in regard to a rising or falling prothrombin time as well as to the particular level at the time. Although the statistician undertook the study to see what the prothrombin times were, it was believed of interest to review the records in the 92 cases with regard to deaths. Nine patients (10 per cent) died. Postmortem examinations were performed in seven; no pulmonary embolus, peripheral embolus, or hemorrhagic complication was found.

In the series of fatal cases, already mentioned, studied by McQuay, Burchell and Edwards,<sup>10</sup> approximately the same incidence of mural thrombi was encountered when the patients had been treated by Dicumarol as when they had not been. However, none of the 16 patients with mural thrombi had gross systemic emboli. Either the clinical or post-mortem records indicated heart failure in all but two of the sixteen cases. On review of the fourteen

cases in which the acute infarction could be accurately dated and in which there were adequate anticoagulant management and mural thrombi, all had large infarcts. The duration of life after the clinical onset of infarction averaged 15 days (range 5 to 26), and duration on treatment with Dicumarol averaged 13 days (range 4 to 26). One patient only had had heparin the first 36 hours following admission on the first day of the infarct. Scarrone and associates<sup>20</sup> found a mural thrombus in only one of their ten cases in which anticoagulant treatment was employed and postmortem examination was performed.

#### Oxygen Therapy

Oxygen therapy is of limited value, but its use is indicated if the patient has pain or dyspnea. In other words, cyanosis or even a laboratory finding of lowered oxygen saturation is not needed before such therapy is instituted. A mask is used if tolerated; otherwise, a tent.

#### Indications for Use of Drugs and Transfusion

In cases of shock it is believed that Arterenal (norepinephrine) is being almost universally accepted as of value even though it will take a long time to establish statistically that this drug has any lifesaving property. As a case in point, I might mention an obese diabetic patient who was brought to the hospital after being in shock for five hours. He was considered moribund in the admitting room.



Arterenol was given and the blood pressure rose and was readily maintained. The patient had two additional episodes of shock with very low blood pressure (Chart 3) and each responded to this treatment. The urinary output was important as an indication of cardiac output's being probably maintained at adequate levels. Death occurred suddenly on the sixteenth day. An extensive antero-septal infarction was present. A thin mural thrombus was present but no emboli could be found.

Since pressor agents are available and can be given rather simply, transfusions are not indicated. It is agreed that an arterial transfusion would be ideal in a shocklike state and we have used it, but it is difficult and the problem lasts for much too long a time for this to be continuously effective.

Morphine is used freely for the relief of pain and apprehension, particularly in the early stages of acute myocardial infarction. In the presence of pain and absence of hypotension, Aminophylline (0.5 gm.) is sometimes given intravenously. When extrasystoles appear, quinidine or Pronestyl is used. Quinidine is still preferred over Pronestyl. With the knowledge that sudden death accounts for such a large number of deaths, my colleagues and I have wondered whether we were not making a mistake in not giving quinidine routinely. We do know it often can modify the number of extrasystoles or abolish them once they have appeared and on this basis many patients do receive quinidine (usually 0.2 gm. every four hours). One might assume that if the sudden death were related to arrhythmia, then quinidine should be given routinely. A recent study by Cutts and Rapoport,<sup>5</sup> however, indicates that it probably is ineffective.

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\*It is obvious that only a very few references could be mentioned, and the emphasis has been placed on personal experience and the observed investigations at Rochester, Minnesota. Since this paper was presented, additional papers have been added to the rapidly growing volume of work, among which is the review given by Wright, I. S., Beck, Dorothy F., and Marple, C. D.: Myocardial infarction and its treatment with anticoagulants: A summary of the findings for 1,031 cases, *Mod. Concepts Cardiovas. Dis.*, 23:208-212, Jan. 1954.

# Current Views on Genitourinary Tuberculosis

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REMOVAL of any genitourinary organ affected by tuberculosis is seldom warranted. This statement is diametrically opposed to the opinions expressed by many experienced urologists before certain antibiotics and other therapeutic agents were found to be effective against *B. tuberculosis*. Thomas first advanced the thesis in 1927 that minute renal tuberculous lesions may heal,<sup>16, 17, 18, 19</sup> but his critics were emphatic on the necessity of removing tuberculous organs.

Medlar has developed the concept over the past thirty years that tuberculosis invades the kidneys through the bloodstream and that many of the metastatic lesions undergo a healing process.<sup>8, 9</sup> Most of his contemporaries insisted that healed lesions were never evident at necropsy, but they were referring to gross caseocalcific lesions, while Medlar's data—collected in vast amount from Bellevue Hospital—prove that microscopic cortical lesions heal. Medlar stated that in 98 per cent of cases with miliary renal foci the disease is bilateral, but when the disease has advanced to ulceration of the renal papilla the proportion of bilateral infections is diminished to 60 per cent, since the other kidney has healed in the meantime.

Wildbolz did not accept the premise of bilateral invasion, and even contended that a normal kidney might filter bacilli. In 1938 he reported that 60 per cent of patients treated by him recovered after nephrectomy but did not comment on the possibility that failure in the other 40 per cent of the cases may have been due to tuberculosis of the remaining kidney.

Hugh Young was the leader in America in urging that all tuberculous genitourinary organs should be removed for the best possible recovery and increased life expectancy. Reports of data from Seaview Hospital in New York, however,<sup>4, 10</sup> not only contradicted the belief that the remaining kidney will improve after nephrectomy but indicated that the disease progresses more rapidly in the remaining kidney.

## **PATHOGENESIS**

Some of the conflict in the statements cited is due to the fact that many of them are incomplete.

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*• Tubercle bacilli are spread by the blood stream to the kidney in miliary fashion from the primary pulmonary lesion. Activation, followed by arrest, may delay development of the disease in the kidney for many years or "healing" may occur. Renal ulcerative lesions are the most frequent source of infection of other genitourinary organs.*

*In pyelograms there is no particular characteristic of lesions of tuberculosis. Cellular elements in the urine of a patient with tuberculosis of other organs should lead to urine culture and guinea pig inoculation for mycobacterium tuberculosis.*

*Treatment with streptomycin, isonicotinic acid and/or para-aminosalicylic acid should be started as soon as genitourinary tuberculosis is proved. Patients with advanced lesions usually receive great benefit from these medications; even though organisms may not be eliminated they are definitely diminished in activity. Excision of diseased organs or tissue may be necessary in a few cases.*

No tuberculous lesion can be considered "healed"; reactivation is possible whenever any of the many protective mechanisms is disturbed. The primary complex consists of a pulmonary parenchymal lesion with involvement of associated lymph nodes.<sup>1, 5</sup> Local secondary progression from the focus may occur but is unusual; miliary spread through the bloodstream leads to the development of allergic sensitivity to the organism. If bacilli are disseminated from the pulmonary lymph nodes or from an activated parenchymal lesion to the renal capillaries, glomerulitis may result, and then arrest or "healing" may follow. Cellular elements are not detectable in the urine until the disease has extended to the tubule and ulceration has occurred. Eventually, through this ulceration or through lymphatic extension, the medulla and the renal papilla are reached, probably in showers of reinfection and stages of reactivation. Positive findings may be obtained on urine cultures, and later followed by negative results.

Increasing activity with ulceration and caseation may occur in any part of the kidney. One or more calyces may be obliterated by reaction fibrosis, or

bacterial invasion of the pelvis and ureter may cause increased dilation and constriction and autonephrectomy. Calcium salts are deposited slowly.

#### DIAGNOSIS

Periodic urinalysis should be done in every case of tuberculosis. A trace of albumin—evidence of tuberculous glomerulitis—is rarely observed, and positive finding on culture or guinea pig test is usually not obtained until erythrocytes or leukocytes are detectable in the urine. Thomas was the first to inject sediment from six specimens of urine, two of which were from 24-hour collections, into one or two guinea pigs, thus insuring a sufficient number of bacteria to cause active disease. Both culture and guinea pig tests should be made, and in the greater number of tests in each case the result will be in agreement. American Trudeau Society media No. 1 and No. 2 and the Lowenstein modification should be used for each specimen. If fewer than ten colonies develop on a Petri dish it is likely that infection will not develop in the guinea pigs tested with the same specimen.

The same tests should be made in chronic pyelonephritis, since other bacterial infection is evident in about a third of all cases of renal tuberculosis. Microscopic hematuria may be the first evidence of renal tuberculosis as well as of other conditions.

Hugh Cabot said that tuberculosis might be disseminated by cystoscopic examination and retrograde catheterization, but at that time the genitourinary tract itself rather than the bloodstream was thought to be the route of infection. Early in the disease there may be no dysuria or frequency, no inflammation of the ureteral orifice or trigone, and no tuberculous nodules. A test tube of urine from each kidney is not a sufficient amount for detection of slight infection. Protracted instrumentation, however, may cause great distress to the patient, and resultant bleeding may obstruct the catheters.

There is no single distinctive roentgenographic feature that is typical of renal tuberculosis. However, rarely in non-specific pyelonephritis is a focalized ulcerative deforming process seen. Retrograde pyelograms usually give much better definition of pathologic changes than do excretory urograms. Even with the best of visualization, if there is evidence of ulceration or irregularity of the calyceal margins it signifies moderate, not minimal, involvement. If the structure is dilated or distorted, advanced disease is indicated.

#### TREATMENT

The treatment of renal tuberculosis is still a long process in which present methods are by no means

satisfactory, since caseation necrosis is irreversible.<sup>6, 7</sup> Regardless of what drugs are combined in treatment, the prognosis is worse with larger lesions, for limitation of the blood supply by endarteritis and obliterative thrombosis together with necrosis and fibrosis creates a virtually insurmountable barrier to vascular diffusion of any drug.

Relatively few drugs are used in present-day chemotherapy of genitourinary tuberculosis. Tuberculin, chaulmoogra esters, promin, diasone and tibione, among others, are being used to some extent.<sup>11, 12, 14</sup> The tubercle bacillus is a facile organism with remarkable adaptive features. It may be susceptible to a combination of therapeutic agents which act synergistically and yet are in such low concentration that bacterial resistance develops slowly.

Isonicotinic hydrazide (INH) is dramatically effective for a short time but should be used in conjunction with streptomycin or para-aminosalicylic acid (PAS) or both. Their total effect is such that reproduction, invasive features and toxicity of the mycobacterium may be altered permanently. Recent use of INH labeled with radioactive carbon has indicated a higher concentration of the agent in the dense caseous tissue than in the more fluid caseous material.<sup>2</sup> This activity is enhanced by diffusion into the erythrocytes and monocytes. Streptomycin is not diffused into the tissues and even less into the monocytes. The usual dosage is 100 mg. of INH given by mouth thrice daily and 1 gm. of streptomycin given subcutaneously twice a week over a period of one year. Additionally, 12 gm. of PAS may be given daily by mouth. Corper<sup>8</sup> expressed the belief that no therapeutic agent can eliminate the bacillus *in vivo* or *in vitro* in a shorter time. He considered these drugs to be retardants of the organism at best. Spurious conclusions have been drawn regarding the bactericidal efficacy of the drugs because the patient was clinically improved.

It is on the prospect of long-term results as well as on the experience gained from following over fifty patients that it was stated in the beginning of this article that removal of affected genitourinary organs is seldom warranted. However, increasing symptoms, persistent drainage or obvious obstructive pyonephrosis are good indications for excision of part or all of an organ.<sup>13</sup> In the past, perinephric abscesses were drained when both kidneys were involved, but chemotherapy should prevent abscess formation or shorten drainage time to a minimum.

The epididymis may have to be removed if recurrent abscesses form or if the area remains enlarged and painful. Removal of the prostate and seminal vesicle is seldom required.

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## In Viewing the VA Medical Program . . .



The medical profession fully endorses and supports the medical program of the Veterans Administration through which veterans receive medical care and hospitalization without cost for illnesses or injuries incurred as a result of military service (left). It is felt, however, that the federal government should not assume the responsibility for the medical care of veterans whose disabilities are incurred in civilian life and which have no relationship to their military service.



# The Postphlebotic Syndrome

## A Study of Possible Factors in Subjective Disability

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AN ODDITY of the postphlebotic syndrome is that in some cases in which the objective symptoms are slight the subjective symptoms may be so severe as to be disabling, while in other cases the objective symptoms may be quite pronounced yet apparently discommoded the patient hardly at all.

The syndrome, which is quite common, is known by a variety of names, the terms most often used being *thrombophlebotic syndrome*, *post-thrombotic syndrome*, *chronic venous insufficiency*, *lower leg syndrome* and *postphlebotic neurosis*. Although the various terms imply differing etiologic delineations, the majority of the symptoms are similar. The syndrome is usually confined to the lower extremities. It follows thrombophlebitis of a deep vein, such as the iliofemoral or the popliteal, although repeated superficial thrombophlebitis might be a factor. The inflammatory process is similar to that in milk leg following pregnancy. The various objective phenomena that follow the attack of phlebitis are pigmentation, edema, stasis dermatitis, nutritional disturbances of the areas involved, with atrophy of the subcutaneous tissues, fibrosis, recurrent attacks of phlebitis, and inflammation, cellulitis and ulcerations. Evaluating the objective conditions is not difficult; the symptoms that are difficult to evaluate—and that may cause considerable disability—are subjective in nature. *Postphlebotic neurosis* would seem to be the aptest term for them. There is a great variety of subjective sensations such as burning, numbness, pains, tingling, paresthesia, weakness, aching and cramping in the affected extremity, and often there is little correlation between the subjective symptoms and the objective findings.

To gather data that might bring understanding to this perplexing situation, a study was made of diverse groups of patients who had various objective and subjective symptoms that were considered residual from phlebitis. Particular attention was given to what effect the prospect of compensation claims or legal actions for damages might have on the severity of subjective symptoms.

Three hundred patients, divided into three groups

• Three hundred patients with the post-thrombophlebotic syndrome were studied. The lower extremities were involved in the majority of cases. Severe disabling subjective symptoms, such as burning, aching, cramping and shooting pains, occurred in approximately 15 per cent of cases regardless of the presence or absence of objective findings such as ulcerations, edema or dermatitis. Subjective symptoms occurred in about as many men as women. The persistence and severity of disabling subjective symptoms seemed to be unrelated to the possibility of compensation or pecuniary gain. No adequate explanation could be found for the perseverance of disabling subjective symptoms. There was no consistent relation of subjective symptoms and disability to psychic factors.

of 100 patients each, were studied. One group was made up of patients admitted consecutively to the Peripheral Vascular Clinic of the Cedars of Lebanon Hospital, another of patients treated under insurance for occupational injury and the third comprising patients who were not industrially injured and who were treated in private practice. A small number of the patients in the latter group were involved in litigation resulting chiefly from automobile accidents and negligence of others. There was no element of compensation or litigation in the clinic group. The length of time since the acute thrombophlebotic stage in the cases studied ranged from a few weeks to as long as 20 years.

A rather high proportion of the patients were women. In the industrial group there were 60 males and 40 females—an inordinate number of women, considering the high proportion of males in industry. In the nonindustrial private practice group there were 74 females, and in the clinic group 84 females. None of the patients in the industrial group was more than 65 years of age, which was to be expected in view of the fact few elderly people are employed in industry, but patients as old as 85 years were treated in private practice.

The percentage of patients with uncomfortable and even disabling subjective symptoms was ap-

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proximately the same in the three groups studied—about 15 per cent of each group—and there were about as many men as women. For practically every industrially incurred case of post-thrombophlebitic syndrome with severe, disabling, subjective symptoms, a nonindustrial case could be found to match it regardless of whether there was or was not an element of compensation or cash settlement that might be involved. The following cases are illustrative:

**CASE 1.** Bilateral iliofemoral thrombophlebitis developed in a salesman 30 years of age following operation for industrially incurred bilateral inguinal hernia. Upon examination 20 years later it was learned that for the entire intervening period he had been suffering from a great variety of disabling symptoms, such as burning, shooting pains, itching, aching, weakness and cramping of both lower extremities. The aching and cramping disturbed his sleep. He could not keep his legs in the dependent position for more than ten minutes. Within a minute or two of dependency, burning, aching and sharp shooting pains in both legs and feet would appear. These would become increasingly severe, and at the end of ten minutes he would have to elevate his legs or walk about. As a result he had not been able to go to a restaurant or a theater. He stated that it had been impossible for him to lead a normal existence for years. Frequently he had tried to return to work but had never been able to continue more than a few days at a time. He was examined late in the afternoon, after he had been ambulatory for many hours. A few small collateral varicosities were present. The edema of the legs was minimal. There was considerable tenderness on finger pressure over the tibial surfaces. The feet were cyanotic when in the dependent position. Pigmentation was present about the lower legs. The skin was warm. The peripheral arterial circulation was normal.

The patient had been receiving compensation for over 20 years. His wife worked, as the compensation was not sufficient to support both. There were no children. There was no doubt of disability. The patient was intelligent and cooperative, had insight and apparently a stable personality, although after twenty years of disability some personality changes probably had taken place.

**CASE 2.** The patient, an unmarried male physician 52 years of age, had had bilateral iliofemoral thrombophlebitis following an operation for varicose veins several years previously. There was no question of compensation litigation, or monetary gain. The subjective symptoms were burning, tingling and shooting pains in the legs and feet when they were dependent more than a few minutes. Cramping and aching in the legs, especially at night, occurred frequently, and these symptoms were severe if the patient had been on his feet for prolonged periods during the day. Edema was slight and well controlled with elastic bandages. The patient said that it was becoming increasingly difficult for him to appear in public,

as at restaurants or the theater, where he would have to sit for periods of more than ten minutes, owing to the discomfort that developed when the legs were dependent. There was pronounced tenderness over the tibial surfaces. Changes in the skin were minimal. Evidence of adequate collateral venous circulation was appearing. The peripheral arterial circulation was normal.

The patient was intelligent and had no apparent emotional or adjustment problem. No explanation could be found for the severe subjective symptoms. The objective findings were minimal.

In many cases in the present series, the patients made little complaint even though objective symptoms seemed severe. The following cases are illustrative:

**CASE 3.** A truck driver 41 years of age who did heavy labor received a fracture of the pelvis in a truck accident. Unilateral iliofemoral thrombophlebitis developed while he was in hospital. Upon examination a year later, pronounced pitting edema, extending from the ankle to the groin, was noted. Redness, heat, stasis induration and eczema also were observed. The patient complained only of a slight heaviness and aching in the leg after a day's work. He had no disability and had lost no time from work since his discharge from the hospital.

**CASE 4.** A business executive 62 years of age was walking on the sidewalk when he was struck in the leg by a piece of lumber that fell from a moving truck. Ilio-femoral thrombophlebitis developed. He was observed several months later because of marked edema and inflammation of the leg. He complained only of "heaviness" of the leg. Although the edema was considerable and poorly controlled and even though the patient had to change his routine of life considerably owing to the necessity of elevating the leg at frequent intervals, he was not interested in legal action for damages despite the fact he seemed to have incontrovertible grounds.

Two cases in which the postphlebotic syndrome occurred in the upper extremities were observed. The patients were women and in both instances the cause was industrial accident. In one case the objective findings were obvious and subjective disability was slight, and in the other the converse was true.

**CASE 5.** The patient was a 30-year-old white divorcee who supported her two children by working as a sealer in an aircraft plant. Swinging down from the crew's quarters of a plane, the patient strained her arms and the right arm became swollen and inflamed. A thrombus was removed from the axillary vein. The edema, discoloration and inflammation slowly subsided. The patient returned to work six months later.

Seven months after the injury, increases in linear measurements were noted, the surface temperatures were elevated and there was enlargement of veins

over the anterior chest wall and the affected extremity. The only subjective symptom was complaint of slight aching and discomfort on dependency or prolonged effort. The patient resumed her previous work without complaint or loss of efficiency.

**CASE 6.** The patient, a white woman 39 years of age with one child, had worked as a saleswoman at the same store for eight years without time off. Leaning over to pick up a cigarette package, she struck the left anterior chest wall against the corner of a counter at the store where she worked. Superficial thrombophlebitis developed at the site and quickly spread over the anterior wall of the chest, the shoulder and the arm to the hand. Superficial and deep veins were involved. The thrombophlebitis gradually subsided and when the patient was examined five months later all objective evidence had completely disappeared except for a slight fullness in the forearm and increased visibility, under infrared light, of the superficial veins of the affected area. However, the patient complained of pronounced disability and of inability to return to work. She said the extremity ached and was heavy and that there was scattered transient superficial tenderness over the arm and forearm. The aching and disability were worse when she was emotionally upset, the patient said; and she said she frequently felt like crying when she thought of her disability.

In these two cases, the patient with apparently the greatest emotional and adjustment problem had the least subjective disability. In neither case was compensation or the cost of medical treatment a factor. Both patients were well cared for by the compensation insurance carrier.

#### DISCUSSION

Adequate explanation for the severe subjective complaints of some patients in the absence of commensurate objective findings is lacking. Allen and Brown,<sup>1</sup> in discussing postphlebitic neurosis, emphasized that the condition was observed almost exclusively in women. That observation was not borne out in the present series. However, the statement by Allen and Brown that disability exists for a period far longer than can be explained on an organic or vascular basis is concurred in. Allen and Brown were of the opinion that patients with subjective symptoms being considered were in general emotionally unstable and of inadequate makeup. This was not

completely substantiated in the present study. Only a small number of the patients were unstable or inadequate.

In this study no reason could be found for the perseverance of subjective symptoms, nor were phenomena observed that might help in determining prognosis. At one time it was thought that subconscious fear of a pulmonary embolus with the possibility of sudden death was a factor in focusing attention on the affected extremity. Later, however, it became apparent that many patients had no idea the disturbance was due to vascular disease. That monetary gain or compensation might be a factor likewise was not substantiated. Organic factors, such as ulcerations, eczema, localized thrombosis and tissue anoxia, could not be inculpated, for they were not present in the majority of patients who had subjective complaints.

#### TREATMENT

The nocturnal cramps and aching were best relieved by quinine, Benadryl (Parke-Davis) or Hydergine (Sandoz) given sublingually. DeCamp and co-workers<sup>2</sup> in a study of venous pressure in patients with the syndrome, noted that a number of patients voluntarily said they were completely relieved of all symptoms following venous pressure determinations alone. Sympathectomy was reported by Edwards<sup>3</sup> to be of no value. Operations on the veins, such as ligation and stripping, and the injection of sclerosing agents have likewise proven valueless. Use of elastic compression bandages with elevation of the affected extremity gave the greatest measure of relief. However, symptoms persisted even when edema was controlled. It was noted that the patients resisted encouragement and reassurance and were reluctant to increase physical activity.

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# Occupational Aspects of Coccidioidomycosis

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PHYSICIANS WHO TREAT PATIENTS with coccidioidomycosis may be called upon from time to time to decide whether or not a case may be of occupational origin. To make a sound decision, accurate, detailed and current knowledge of epidemiologic aspects and pathogenesis of the disease is necessary. Excellent reviews of these aspects are available.<sup>8, 23, 26</sup>

As to the medicolegal aspects, physicians must be guided not by personal preconceptions but by knowledge of principles and precedents in compensation medicine. Cases have been accepted as occupational by insurance carriers, the Industrial Accident Commission of California and the courts. The validity of these precedents must be weighed in the light of present knowledge concerning the disease. As Downing<sup>6</sup> pointed out, although medicine is constantly altering its opinions as a result of increased scientific knowledge, the courts are likely to base their findings on examples of past decisions in similar cases rather than on medical research which often contradicts these findings.

Decisions of this kind are particularly difficult with regard to cases of coccidioidomycosis in an endemic area, and each must rest on the merits of the individual instance. If the occupation exposes the worker to a risk of infection greater than that of other members of the community, ascribing infection to the nature of the occupation may be justified. Physicians should recognize that while absolute proof may be impossible, from a legal aspect it is an inadmissible concept that uncertainty of proof can ever destroy a legal right.<sup>15</sup> Here analogies exist with numerous other diseases including such widely different conditions as leptospiral infections<sup>28</sup> and cancer of the skin.<sup>6</sup>

The material presented is grouped in seven categories ranging from those in which assignment of occupational origin is easily made to those in which evaluation is exceedingly complex and difficult.

## 1. Laboratory Infections:

It is generally accepted that whenever a culture of *coccidioides immitis* on solid media is opened, all persons in the vicinity may be exposed to infection. In endemic areas, laboratory personnel are usually aware of this danger.

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*• Infections with coccidioides immitis have been frequently associated with circumstances suggesting the likelihood of occupational origin. Some cases have been accepted as compensable by insurance carriers, the Industrial Accident Commission, and the courts. The factors considered in determining whether or not infection is of occupational origin are reviewed under the following headings.*

### 1. Laboratory infections.

2. Other infections due to exposure to contaminated articles, arising outside endemic areas.

3. Infections in employees entering endemic areas pursuant to their occupations.

### 4. Primary cutaneous inoculation.

5. Localization and/or aggravation of pre-existing coccidioidomycosis by occupational injury.

6. Infections in agricultural workers imported into endemic areas.

7. Infections in residents of endemic areas alleged to result from occupational exposures.

In a survey of laboratory-acquired infections in the United States, Sulkin and Pike<sup>29</sup> found record of a total of 63 cases in which the infecting agent was a fungus; it was *coccidioides immitis* in 49 cases, one of them fatal. An early case, cited by Tomlinson,<sup>30</sup> was that of a medical student who was infected while working with cultures of *C. immitis* in the United States. Nabarro<sup>19</sup> cited an instance occurring in England. Looney and Stein<sup>13</sup> reviewed the pertinent literature and reported a case in New England.

## 2. Infections (Other Than Laboratory) Acquired Outside Endemic Areas by Exposure to Contaminated Articles:

Skinner<sup>24</sup> reported the case of a worker in a wool-scouring plant in Massachusetts. He had never been in an endemic area. After sorting dusty, sandy wool from an endemic area he became ill. The illness began as a "cold" several weeks after the last exposure. Two months later the patient died of disseminated coccidioidomycosis.

The only case of coccidioidomycosis reported from Canada<sup>16</sup> was that of a 61-year-old white man



with an exposure history analogous to that in the preceding case. The patient had never been out of Nova Scotia except for military service twenty years earlier.

Coccidioidomycosis in workers who handle possibly infective material, but who also live in areas where occasionally a case of coccidioidomycosis, apparently endemic, is reported, raises a more difficult medicolegal question. The following case has been the subject of a court decision:<sup>35</sup>

A truck driver, while working in Los Angeles, handled freight from various points of origin including oats, beans, wheat, cotton and hay from the San Joaquin Valley. His working conditions were very dusty. He contracted coccidioidomycosis, and a court held that he had contracted the disease during his employment as a truck driver in handling commodities from the endemic area.

Schenken and Palik<sup>22</sup> reported the case of a 35-year-old Negro man who was observed at the Charity Hospital of Louisiana with disseminated coccidioidomycosis. It seemed probable that he had acquired the disease while handling infective articles during employment within the urban Los Angeles area six months earlier.

### 3. Infections in Employees Entering Endemic Areas Pursuant to Their Occupations:

Employment is considered a causative factor when it takes the employee from a community free of a disease to another where it is prevalent. In the case of coccidioidomycosis, infections have been attributed to little more than traveling through an endemic area.<sup>14</sup>

Such a case was reported by Hirsch.<sup>20</sup> The patient was a Negro porter employed on the Santa Fe Railroad between Chicago, his home, and Los Angeles. Following a return trip from California, illness began with pleurisy as the first manifestation, and the patient died of disseminated coccidioidomycosis.

A San Francisco coffee salesman<sup>40</sup> was found by an award of the Industrial Accident Commission of California to have contracted coccidioidomycosis in the course of business trips made through endemic areas. The disease began with symptoms of a bad cold shortly after the man had spent two weeks on company business in an endemic area. The appellate court upheld the award, stating that proof that the disease was contracted in the course of employment need not attain absolute certainty.

A 41-year-old white crane operator<sup>36</sup> was hired in Los Angeles to work on a project at Muroc Dry Lake. While there he contracted coccidioidomycosis. The court held that while he was not by the nature of his employment exposed to any greater extent than any other resident of Muroc Dry Lake, he was ex-

posed to the disease to a greater degree than residents of Los Angeles County. The disease was therefore held to arise out of employment. The court made the further statement that the disease is not endemic in Los Angeles County. Present knowledge indicates that this is not completely accurate; the disease is certainly more highly endemic in some other areas, but endemicity in Los Angeles has been proved in recent years.<sup>2, 11, 12</sup>

Seven of 14 Stanford University faculty members and students<sup>5</sup> who were exposed to dense concentrations of dust in the air while on a field trip to San Benito County contracted coccidioidomycosis. The incubation periods were between nine and 14 days. The fungus was later recovered from the soil at the site. Were the field trip incident to their teaching duties, it would seem a fair assumption that, for the faculty members, the coccidioidomycosis so incurred was occupational.

Within the last three years at least six resident physicians at the Kern General Hospital had symptomatic primary pulmonary coccidioidomycosis necessitating rest and/or hospitalization. Inasmuch as their exposure was owing to their having been engaged to come into an endemic area, the hospital accepted the condition as related to employment to the extent of continuing salaries while the physicians were incapacitated. In the case of one of the physicians, an American Indian, complications ensued from the disease and the question of compensation was referred to the insurance carrier, which rendered an opinion to the effect that the condition was not compensable. The matter was not pursued further.

### 4. Primary Cutaneous Inoculation:

Primary cutaneous inoculation as the portal of entry for coccidioidomycosis is probably very rare. In experimental animals the disease can be produced by scarification of the skin and applying a drop of pus from infected tissues. This was done by Rixford<sup>20</sup> in a study of the first case reported in this country.

Clinical cases of presumed primary cutaneous inoculation are cited in the older literature. Reviewed in the light of modern knowledge of the disease, however, they seem for the most part to have been instances of disseminated coccidioidomycosis with solitary cutaneous manifestations. However, the author has observed at least one case in which rather rigid criteria for the diagnosis of cutaneous inoculation seemed to be satisfied. A mortician pricked his finger while preparing a body in which evidence of a "peculiar kind of tuberculosis" was noted. A granulomatous lesion appeared at the site of injury. The clinical appearance suggested infectious granuloma, particularly cutaneous inoculation tuberculosis. *C. immitis* grew on cultures. In the next five

years no evidence of disseminated coccidioidomycosis appeared.<sup>32</sup>

A similar sequence of events was reported in another case—that of a physician whose finger became infected when he was dissecting.<sup>4</sup>

A report of what may have been another such instance concerns a 40-year-old man,<sup>31</sup> living in Kansas, who received a cut on a finger while working in a garden. The same day he used the unbandaged hand in feeding mash to chickens. The mash was a packing house product made from condemned cattle. Inflammation developed at the cut and became progressively worse. *C. immitis* was found in the lesion.

#### 5. Localization and/or Aggravation of Preexisting Coccidioidomycosis by Occupational Injury:

From the viewpoint of compensability, a much more frequent problem than that of primary cutaneous inoculation is whether an injury may have caused aggravation or localization of preexisting coccidioidomycosis. Cases in which the disease was believed to have resulted from injury were frequently reported in the older literature. In some reports the authors implied that the injury may have been the direct cause of infection. At the time the reports were published the endogenous reinfection nature of the disseminated phase of the disease was not understood. The difficulty is compounded by the chronic and occasional seemingly solitary nature of some lesions.<sup>7</sup> This confusion has been manifested until very recent years.

Campbell<sup>24</sup> said that the rule is well established in most jurisdictions that an aggravation of an existing infirmity caused by an industrial accident is compensable even though the accident would have caused no injury to a normal person. Also, it is applicable in this regard that every aggravation of preexisting disease by injury is compensable, at least for the proportion of disability thus caused.<sup>33</sup>

In many ways analogies with syphilis exist. In regard to syphilis, Miller<sup>18</sup> stated that it is well known that lesions of late syphilis are often precipitated by relatively minor injuries, and that it is often necessary to appraise industrial responsibility in such cases.

Rubinstein<sup>21</sup> cited instances in which cutaneous tuberculosis was accepted as occupational on a similar basis.

The author knows of no published experimental work to determine whether coccidioidomycosis has in fact a tendency to localize at the site of injury, or be aggravated by injury. Published case reports to that effect do not firmly establish such a thesis. On the other hand the possibility cannot be ruled out.

A few patients with local cutaneous lesions of coccidioid granuloma have been given compensation

without being brought before the Industrial Accident Commission of California,<sup>17</sup> and one such problem has been the subject of a decision of the commission. An oilfield worker<sup>39</sup> received a trivial injury of the leg when he struck it against a machine. A week later the leg swelled. A diagnosis of coccidioid granuloma was made. The patient once had had an active pulmonary infection which had been considered tuberculosis. The Commission recognized that the pulmonary condition may have been a primary coccidioid infection and that the lesion of the leg might be metastatic. Nevertheless, the Commission held that whether the infection entered through a puncture of the skin or affected the disabled part by reason of localization there of a general infection in the blood stream, the disease in the leg was due to the injury. Compensation was accordingly awarded.

#### 6. Infections in Agricultural Laborer Imported into Endemic Areas:

In many areas much migrant labor is still employed. This facet of the problem of coccidioidomycosis in agricultural laborers has so many ramifications and is in general so complex as well as statistically important that it deserves far more than the brief mention possible in this presentation. In addition to the extremely dusty conditions to which these workers may be exposed, their risks are enhanced by the fact that many are non-whites, known to be much more liable to acquire the disseminated form of the disease.

Mexican nationals are brought into this country under the terms of an agreement between the governments of United States and Mexico.<sup>41</sup> This contains a number of provisions relating to health. Each candidate for admission must be examined by the U. S. Public Health Service. The employer is required to provide for the Mexican worker the same medical care and compensation for injury provided in like cases for domestic agricultural workers under the applicable state law. Insofar as the author could determine, the applicability of this law to coccidioidomycosis has not been the subject of a court decision. However, such workers have been hospitalized from time to time at various county hospitals because of coccidioidomycosis, as in the following case:

A 32-year-old Mexican national who had been in California less than a year, working as a farm laborer, was admitted to the Los Angeles County General Hospital in October 1952, with a pulmonary infection. Later a granulomatous cutaneous manifestation of coccidioidomycosis appeared.

Since coccidioidomycosis undoubtedly is endemic in some parts of Mexico, there is always the possibility that a Mexican national who has it in this country actually was infected in his own country.

Filipino laborers, frequently employed in vineyards in endemic areas, seem to be especially liable to dissemination of the disease. The same may be true of Puerto Ricans, numbers of whom have recently been brought into California. Disseminated coccidioidomycosis has already been diagnosed in Puerto Ricans, one of them having been treated at the Kern General Hospital recently.

The disseminated disease has also appeared in white imported laborers. A 22-year-old Basque, brought to Merced County as a shepherd, acquired the disease in 1952, and the insurance carrier accepted the case as occupational.

As to native migrant workers, it is certain that numbers of them have acquired coccidioidal infections, but whether as a direct outcome of their employment or extra-occupationally, it is virtually impossible to decide in many instances. However, there is one group, relatively small, in which the occupational responsibility is more clear. This group is made up of workers hired in the urban area of Los Angeles by labor contractors and transported each day to the San Joaquin Valley and returned to Los Angeles the same evening. The following is an illustration.

A 38-year-old Negro woman was admitted to the Los Angeles County General Hospital with disseminated coccidioidomycosis. She had been employed as a chambermaid in a downtown Los Angeles hotel from 1945 to 1949. Then she began picking cotton in Kern County. She was transported from Los Angeles by a labor contractor each morning, and returned to Los Angeles each evening.

In most instances, however, the hiring is done near the place of employment, and the question of occupational liability then is much less clear.

#### *7. Infections in Residents of Endemic Areas Alleged to Result from Occupational Exposure:*

If the patient has lived in an endemic area prior to employment, a decision as to whether the disease was or was not contracted in the course of employment may have to be made virtually without the benefit of differentiating facts—and such are the circumstances in by far the largest number of cases.

In one such case a white man, hired to clear new land with a tractor and leveller, was exposed to very high concentrations of dust. Evidence of a primary pulmonary infection developed within a few weeks. The case was reported to the insurance carrier as occupational and was so accepted by it.<sup>1</sup>

A similar case was the subject of a court decision.<sup>37</sup> A man who had lived most of his life in an endemic area was employed on a wheat ranch in San Luis Obispo County from June 21 through July 23, 1949. His work was principally operating a combine harvester and driving a tractor, and in this

employment he was constantly exposed to heavy concentrations of dust. After a month at this job, he consulted a physician because of an illness which was diagnosed as coccidioidomycosis. The Industrial Accident Commission held that the disease arose out of his employment, and the appellate court upheld the decision.

On earlier occasions, however, the courts have ruled otherwise. Miller<sup>17</sup> reported instances of two patients, employed on the same construction project for less than three months, who died of coccidioidomycosis within three weeks after the onset of symptoms. The Industrial Accident Commission, he said, established a precedent and ruled that the disease was not of industrial origin in these cases. The opinion was based on the proof of chronicity and "the risk of commonality" which implies that anyone living in the endemic area is subject to the same risk.

In discussing the question of contagious and infectious diseases as occupational, Hanna<sup>38</sup> pointed out that employment becomes a causative factor only where it exposes the employee to the risk of contracting such diseases to a greater extent than the community generally or, as already discussed, where it takes the employee from a community free from the disease to another where it is prevalent. In the present state of knowledge of epidemiologic aspects of coccidioidomycosis, it may be almost impossible to decide whether any given occupational exposure involves greater risk than the employee's extra-occupational activities, where his home is within an endemic area. The decision in such instances must rest upon the circumstances in the individual case.

As to dissemination, the most susceptible persons are non-white males of working age. Gifford<sup>9</sup> pointed out that in a 38-year period 56 per cent of all cases and 63 per cent of deaths occurred in the age group 25 to 54 years. A preponderance of males in the figures for disseminated coccidioidomycosis holds only for the age group 14 through 60. In a survey of 500 cases covering all types of coccidioidomycosis, Birner<sup>3</sup> found an approximately even distribution between males and females in those under 13 and over 60 years of age, but a preponderance of males in the age group 14 through 60.

#### DISCUSSION

Infections with coccidioidomycosis are frequently associated with circumstances suggesting occupational origin.

With the exception of those cases where aggravation of a preexisting disease is considered, criteria for the establishment of a case as occupational should, ideally, include evidence that the patient was free of the disease prior to the suspected employment exposure. Such evidence will often not be available,

however. Second, there should be no chronologic discrepancies between the alleged infecting exposure period and the onset of the disease. Third, the working conditions should be clearly productive of possible infecting exposures. Fourth, extra-employment exposures to an equal or greater degree than work exposures should be reasonably excluded or evaluated. If these rather rigid criteria are met, it would seem that the occupational origin of the case has been established.

Initiation of action to establish any case as occupational is, in general, a function of the attendant physician. However, the socioeconomic importance of this problem to the entire Southwest goes far beyond the assignment of industrial liability in individual instances. It is to be hoped that increased awareness of the occupational aspects of coccidioidomycosis will lead to intensive investigations actively supported in the future by private as well as public agencies.

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# Recalcitrant Vesiculopustular Eruptions of The Palms and Soles

## Treatment with a Sensitized Mixed Vaccine

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BAIRD<sup>1</sup> HAVING REPORTED the cure of so-called pustular psoriasis in all of 12 patients who were treated with Staphylo Serobacterin Vaccine Mixed (Sharpe & Dohme), a study was made of the effect of the vaccine in the treatment of recalcitrant vesiculopustular eruptions of the palms and soles.

The broad term "recalcitrant vesiculopustular eruption" is used to describe the conditions dealt with herein because many of them were not definite clinical entities. Included were conditions that have been called, variously, pustular psoriasis, pustular bacterid, acrodermatitis continua, dermatitis repens and recurrent palma-plantar pustulosis. Cases of dermatophytosis, dermatophytid, contact dermatitis, and dermatitis medicamentosa, as determined by history, laboratory tests and clinical examination, were excluded. There was no evidence of psoriasis in any of the patients treated. Investigation of possible foci of infection was not carried out. However, one of the patients had infected teeth extracted while under observation without effect upon the dermal eruption. In another case the dermal condition flared concomitantly with the draining of a rectal abscess and did not subsequently clear. Dyshidrosis and disturbances in sweating may have been complicating factors in some of the cases. It is improbable that pyogenic infections were a factor in any case, for patients had had previous systemic antibiotic therapy without benefit.

The criteria for inclusion of patients in the series were chronicity of disease and failure to respond to previous therapy. Twenty-two patients were included. Seven were from the University of California clinics and 15 from the private practice of the various members of the staff. Eleven patients had involvement of the hands alone, five of only the feet, and six of the hands and the feet. Vesiculation was present in all cases. Pustulation was not a constant finding but was present at some time in the majority

*• Twenty-two patients with recalcitrant vesiculopustular eruptions of the palms and soles were treated with a series of subcutaneous injections of a sensitized mixed vaccine. In seven cases the skin cleared and remained clear for periods of observation varying from five to sixteen months. In nine there was improvement or clearing but subsequent recurrence. Six patients had no improvement.*

of cases. The duration of eruption varied from 8 months to 24 years and the average was 6.4 years. Most of the patients had previously received radiation therapy, systemic administration of antibiotics, treatment with antihistamines, and various forms of local therapy.

Staphylo Serobacterin Vaccine Mixed (Sharpe & Dohme) was injected subcutaneously either once or twice weekly in increasing doses as tolerated, beginning with 0.05 cc. and building up to 1 cc., usually by increasing the dose by 0.1 cc. at each visit. The duration of treatment varied from four to sixteen weeks and the average was eleven weeks. No serious reactions were noted, although some of the patients reported redness and tenderness at the site of injection and some complained of malaise 4 to 48 hours following the injection. In some cases there was a local area of induration at the site of the injection which persisted for two to four weeks. The patients, in addition, were given local and symptomatic treatments as indicated.

In seven cases the skin completely cleared and remained clear for periods of observation ranging from 5 to 16 months. Nine patients had improvement or clearing and subsequent flare but felt the vaccine was at least of temporary benefit. In six cases there was no improvement.

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Presented before the Section on Dermatology and Syphilology at the 82nd Annual Session of the California Medical Association, Los Angeles, May 24-28, 1953.

# Acid Detergent Douche Therapy of Leukorrhea

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OFTEN IN THE treatment of of leukorrhea there is early favorable response to therapy but subsequent exacerbation. One reason may be that antibacterial agents used in treatment interfere with the restoration of physiologic environment by repressing the growth of normal vaginal flora.

The pH of the vagina is normally in the range of 3.8 to 4.5, and normally lactobacilli of Doederlein are present and there is discharge of mucoepithelial material. When pathologic states develop, desquamation of epithelial cells increases in proportion to the severity of inflammation. The loss of glycogen deposits in the desquamated cells causes a decrease in the conversion of carbohydrates into lactic acid and the resulting increased alkalinity of the vagina is hospitable to the pathogens and inimical to Doederlein's bacillus. Restoration of normal pH and flora combats the pathogenic organisms.

Daily douching often is a part of the treatment administered in dealing with leukorrhea, and since it is possible that the solution used might contain agents that could hamper the regrowth of Doederlein's bacillus the authors believed that a douche solution having the following properties would be of value:

1. It should contain a harmless, non-sensitizing detergent to remove the coagulated debris and mucous deposits.
2. It should be acid and should be buffered sufficiently to maintain the physiological pH.
3. It should not contain any antibacterial agents, since the contact possible during douching would be so fleeting that specific antibacterial action could not be expected.

Accordingly, the following formula\* was used in douches in the treatment of a variety of mucopurulent conditions of the vagina:

Citric acid, U.S.P.....	2.5 per cent
Acetic acid, U.S.P.....	4.0 per cent
Lactic acid, U.S.P.....	2.0 per cent
Sodium lauryl sulfate, U.S.P.....	3.0 per cent
Dextrose, U.S.P. ....	5.0 per cent
Lactose (beta) U.S.P.....	2.5 per cent
Sodium acetate, U.S.P.....	2.5 per cent
Methyl paraben, U.S.P.....	0.2 per cent
Distilled water—sufficient quantity to make .....	100 per cent

\*Pro-acet Douche Concentrate, prepared by Pro-Acet, Inc., Oakland.

*• A harmless acid detergent douche solution based on known physiologic and chemical factors was used in clinical trial on 104 patients having leukorrhea of various causes.*

*When used alone or as an adjunct to other forms of therapy there was a favorable response in 81 per cent of patients with infections who were followed.*

*In non-infectious leukorrhea there was probably no shortening of healing; however, there was effective relief of symptoms in 84 per cent of those who were followed.*

*This acid detergent douche solution may have a wide range of use.*

It should be noted that the solution includes acids that are physiologically compatible and that have maximum buffer capacity at the normal pH of the vagina. These were adjusted to form a buffer by the addition of the sodium acetate. Although it has greater alkaline neutralizing power than the usual full strength acid douche, the buffered product is non-irritating even in its concentrated form. The normal unbuffered acid douche, such as vinegar, is extremely irritating when in contact with inflamed mucosal tissue. Sodium lauryl sulfate U.S.P. was used in the mixture because of its exceptional wetting and surface tension effects and its high detergent and suspending action without harmful effect.

## PATIENTS AND METHODS

One hundred and four patients with mucopurulent discharge of various cause were instructed in the use of the specially formulated douche solution (hereafter described as the "acidified detergent douche solution"). In general the directions were to douche morning and evening with a solution made by adding one teaspoonful of the concentrate to a quart of warm water. More frequent application and stronger concentrations were prescribed when indicated. Occasionally the concentrate was applied full strength.

The patients were told how to douche in the recumbent or sitting position, and especially careful instructions were given to pregnant patients due to the usual contraindications for douching during this period.

Some of the patients had infectious leukorrhea, as diagnosed by microscopic technique, and in others the disease was not infectious.

### Infectious Leukorrhea

Some of the patients with trichomonas vaginalis were treated with the acidified detergent douche solution as an adjunct to diiodo-hydroxyquinoline in the form of vaginal suppositories,\* and some of them were treated with the acidified detergent douche solution only. Some of the patients had monilia vaginitis alone and three of them had monilia and trichomonas vaginitis.† In some cases of monilia infections a vaginal jelly containing the same formulation as the douche solution was prescribed in order to maintain more continuously the pH and normal physiological environment in the period between the two daily douchings.

### Non-Infectious Leukorrhea

Sixty-six patients were treated for non-infectious leukorrhea. In the majority of cases it was a sequel to operation such as hysterectomy or cervical operation, but there were also cases of postpartum cervical erosion, cervicitis, leukorrhea of pregnancy, leukorrhea associated with carcinoma of the cervix, atrophic vaginitis and non-specific vaginitis.

The patients were reexamined from time to time, the interval depending on the kind of leukorrhea being treated. Some of the patients with infectious leukorrhea were observed for periods as long as four months, and in all such cases careful microscopic examination of vaginal exudate was carried out. In most of the non-infectious cases, twice daily douching was continued for three to four weeks, and in the infectious cases for three to four months.

The results of the treatment with the use of the acidified detergent douche solutions are shown in Table 1.

### DISCUSSION

Although the number of cases of trichomonas infestation was small, the results in the present series indicated that a properly formulated douche solution may play an important part in the reduction and subsequent elimination of the parasite. Patients using the acidified detergent douche solution had immediate relief from itching, burning and discharge, and only one patient was found to be infested when examined after four months of douche therapy. The group using diiodo-hydroxyquinoline vaginal suppositories along with the acidified detergent douche solution was too small in number to warrant any definite conclusions as to the potential additive effectiveness of the combined procedures. However, whether

\*Floraquin suppositories (G. D. Searle & Co.) were prescribed.  
†Monilia and trichomonas were found microscopically to coexist despite the usual statements to the effect that they will not live in the same pH range.

TABLE 1.—Results of acid detergent douche therapy in the treatment of leukorrhea.

Diagnosis	No. Cases	Result—		No Report
		Good	Poor	
INFECTIOUS LEUKORRHEA (identified by smears)				
<i>Trichomonas:</i>				
<i>Douche and adjunctive‡ therapy:</i>				
Pregnant .....	1	....	1	....
Non-pregnant .....	14	10	1	3
<i>Douche sole therapy:</i>				
Pregnant .....	3	2	1	....
Non-pregnant .....	8	7	....	1
<i>Monilia:</i>				
Pregnant .....	3	1	2	....
Non-pregnant .....	6	4	1	1
<i>Monilia and Trichomonas</i> .....	3	3	....	....
NON-INFECTIOUS LEUKORRHEA				
Postoperative (cervical, cautery, cervical operations, hysterectomy) .....	47	43	2	2
Postpartum erosions (no cautery) .....	9	2	6	1
Leukorrhea of pregnancy.....	3	3	....	....
Carcinoma of cervix (from leukorrhea) .....	3	2	1	....
Atrophic vaginitis .....	1	....	1	....
Non-specific leukorrhea .....	3	3	....	....

‡Good: Abatement of leukorrhea and, in infectious cases, of infecting organism. Poor: Leukorrhea persisting or infecting organism still present.

§Use of diiodo-hydroxyquinoline vaginal suppositories between douchings.

used alone or as an adjunct to older types of treatment, the acidified detergent douche solution had apparently resulted in a complete remission.

The three patients who had trichomonas and monilia together experienced subjective relief of symptoms from the time of the beginning of acidified detergent douche therapy. The infections continued in remission and no recurrence was found when microscopic examination of material from the vagina was carried out several months later.

Patients with monilia leukorrhea had to make frequent office visits for repeated instrumental removal of firmly adherent monilia plaques, from the vaginal walls. The acidified detergent douche solution did not disperse these plaques, but after they were removed instrumentally the continued use of the douche solution apparently played a role in decreasing the formation of new ones and thereby assisted in the reestablishment of the normal physiological environment.

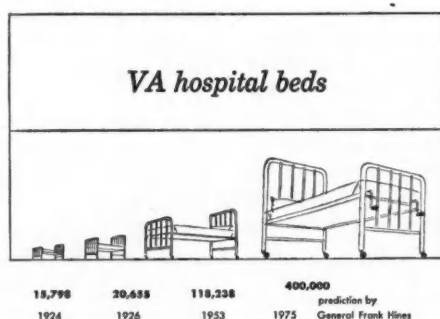
As to the results in treatment of postoperative leukorrhea, which usually abates in time even without treatment, it is not claimed that the douche therapy had any effect on healing time; as here used, the term "good result" with regard to such cases means only immediate subjective relief from the symptoms of leukorrhea. Similarly, leukorrhea of

pregnancy, leukorrhea of cervical carcinoma and non-specific leukorrhea responded well to the preparation. It should be noted, however, that when pathological conditions persisted the temporary relief obtained with the use of the douche was not sustained. An illustration is postpartum erosion in which no cautery was done. In such cases when electrocautery subsequently was carried out, continued use of the douche solution brought symptomatic relief, and ultimately complete healing occurred.

Especially interesting were the control experiments on a number of patients with trichomonas or monilial vaginitis. From the encouraging results achieved with the acidified detergent douche solution as the sole method of treatment, it might be concluded that the normal recuperative powers of the vagina (assisted by the douche solution) have been underestimated as a factor in the restoration of normal physiology.

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### In Viewing the VA Medical Program . . .



Former VA Administrator Frank Hines estimated that by 1975 under existing VA medical legislation, approximately 400,000 hospital beds will be needed. Yet medical authorities are convinced the VA cannot attract sufficient medical personnel to staff more than 120,000 beds. The VA now maintains three times the number of beds needed for treatment of service-connected cases.



# Cerebral Atrophy

## Clinical Manifestations in Adults

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A GREAT DEAL of attention has been given to senile and presenile cerebral atrophy and to the shrinking of the brain incident to deleterious influences at birth or in early life, but the atrophic conditions of the brain occurring in the robust years of adulthood appear to have been largely ignored. Moreover, when such conditions are recognized in persons of the middle years there has been a tendency to classify them as "presenile." In this connection a question that might well be raised is: When does senility begin?

Impressed with the relative frequency with which atrophy is encountered in persons between 25 and 50 years of age, the author reviewed the clinical records of 200 patients with a diagnosis of cerebral atrophy. In the records of the last ten years at the Los Angeles County General Hospital, 100 were found in which significant atrophy was demonstrated either by pneumoencephalogram or by autopsy. The age range was from 22 to 93 years. From the records of the White Memorial Hospital, another 100 case studies were selected of patients between the ages of 25 and 55 years in whom significant atrophy had been demonstrated by either pneumoencephalogram or ventriculogram or both. For the sake of brevity, hereafter the Los Angeles County General Hospital series will be designated as the first series and the White Memorial Hospital series as the second series.

**Age:** In the first series, in which the age range was from 22 to 93 years, there were 61 men and 39 women and in the second series with patients of ages from 25 to 55 years there were 65 men and 35 women (Table 1). A ratio of about two men to one woman was quite constant through to the age of 70 years, but above that age the ratio was reversed. It is of interest that the greatest incidence of atrophy in the first series was in the age group of 40 to 49 years (27 per cent of cases were in that group) and in the second series the highest incidence (39 per cent of cases) was in the 35 to 45 age group.

**Convulsions:** The most constant clinical manifestations in patients up to the age of 55 years was con-

• *A study was made of the cases of 200 patients with demonstrated cerebral atrophy. In patients under 70 years of age cerebral atrophy was twice as common in men as women. Over 70 years the ratio was reversed. The incidence of cerebral atrophy was relatively high in the age group 35 to 50.*

Convulsions were present in more than a third of the 200 patients. Neurological abnormalities were present in 51 per cent of the entire series. Significant personality deviations were observed in 31 per cent. Although the electroencephalogram was abnormal in many patients, it appeared to be of little aid in the diagnosis of the cerebral atrophy. The spinal fluid did not seem to be consistently altered in any significant or diagnostic manner.

Most of the patients in the 35 to 50 year age group did not have the symptoms characteristic of Alzheimer's disease, and in only a few cases did the symptoms resemble those of other recognized disease entities.

vulsions (Table 2). In the first series there were 37 patients with convulsions and only four of them were over 50 years of age. In the second series 42 had convulsions. The incidence was high enough in both series to warrant a conclusion that cerebral atrophy should be considered in the differential diagnosis of a convulsive disorder beginning in adulthood without apparent cause.

**Personality Disorders:** The frequency of gross personality deviations in this rather large group of patients was less than one might expect. Significant personality deviations were observed in 40 of the patients in the first series and in 22 of those in the second series (Table 3). In the first group, 17 were psychotic, 15 were deteriorated, and eight were severely neurotic. In the other group there were no psychotic patients, only seven with deterioration and 15 with severe neurosis. In both series the incidence of deterioration was highest in the older age group. More than half of the psychotic patients were over 60 years of age. While 36 per cent of the 200 patients had serious mental deviations, the incidence in the

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TABLE 1.—Age and sex of patients with cerebral atrophy

## Los Angeles County General Hospital Series:

Age	Male	Female	Total
20-29.....	1	2	3
30-39.....	2	4	6
40-49.....	19	8	27
50-59.....	13	7	20
60-69.....	17	4	21
70-79.....	3	5	8
80.....	6	9	15
	61	39	100

## White Memorial Hospital Series:

Age	Male	Female	Total
25-34.....	20	5	25
35-44.....	19	20	39
45-54.....	26	10	36
	65	35	100

TABLE 2.—Incidence of convulsions in patients with cerebral atrophy

## Los Angeles County General Hospital Series:

Age	No. Patients	Convulsions	Per Cent
20-29.....	3	2	66
30-39.....	6	4	66
40-49.....	27	15	55
50-59.....	20	12	60
60-69.....	21	2	10
70-79.....	8	2	25
80.....	15	0	0
	100	37	37

## White Memorial Hospital Series:

Age	No. Patients	Convulsions	Per Cent
25-34.....	25	7	28.9
35-44.....	39	19	48.7
45-54.....	36	16	44.4
	100	42	42

TABLE 3.—Incidence of personality deviations in association with cerebral atrophy

## Los Angeles County General Hospital Series:

Age	No. Patients	Neurosis	Deterioration	Psychosis	Total
20-29.....	3	0	0	2	2
30-39.....	6	1	0	0	1
40-49.....	27	4	0	2	6
50-59.....	20	2	3	3	8
60-69.....	21	1	3	7	11
70-79.....	8	0	2	0	2
80.....	15	0	7	3	10
	100	8	15	17	40

## White Memorial Hospital Series:

Age	No. Patients	Neurosis	Deterioration	Psychosis	Total
25-34.....	25	0	2	0	2
35-44.....	39	8	2	0	10
45-54.....	36	7	3	0	10
	100	15	7	0	22

middle adult age group, with which this presentation is primarily concerned, was only about 25 per cent.

**Abnormal Neurological Findings:** Definite neurological abnormality was observed in 102 of the 200 patients—54 in the first group and 48 in the second. The signs varied in severity from abnormal reaction of a toe on one foot to spastic weakness of all four extremities. The two most common clinical combinations were unilateral signs referable to the upper motor neuron beginning in one extremity and spreading to the other on the same side, and spastic weakness of both lower extremities. In many instances the signs and symptoms mimicked those of a space-taking intracranial lesion. Abnormal sensory findings were much less frequent than motor disturbance. In some five patients with demonstrated cerebellar atrophy signs referable to the cerebellum were present. In a few patients the clinical picture resembled that of multiple sclerosis.

## LABORATORY DATA

**Electroencephalography:** Electroencephalographic studies were carried out in 33 cases in the first group and in 27 cases the tracings were abnormal. In the second group electroencephalograms were made in 52 cases and the tracings were abnormal in 39. Although the incidence of abnormalities was somewhat greater in patients with convulsions and neurologic abnormalities and many times focal dysrhythmias were present in patients with lateralized neurologic deficits, this usually was of little help in the overall diagnosis; in many cases it only further confused the issue by helping to complete a diagnostic picture of a tumor where only atrophy existed. The degree of atrophy seemed to have little effect on the electroencephalogram; sometimes tracings were normal even in the presence of gross atrophy.

**Spinal Fluid:** Studies of the spinal fluid are of little help in the diagnosis of cerebral atrophy aside from the fact that if much is withdrawn when the patient is being prepared for pneumoencephalographic studies, the extraordinary volume indicates the brain must be smaller. There was no consistent variation in the spinal fluid pressure. The number of cells in the fluid was normal in most patients except those in whom it could be explained otherwise. There was pronounced variation in total protein content with a tendency to be a little higher than normal in most instances. A normal colloidal gold curve was the rule. In two cases in the second series there was a rise in the first zone, and in two others a rise in the middle zone, but without apparent reason.

Roentgen studies after introduction of air, such as pneumoencephalograms and ventriculograms, or both, appear to be the only satisfactory means of diagnosing cerebral atrophy during life.

#### DISCUSSION

Alzheimer's disease is generally accepted as a presenile dementia, a disease of later middle life, most common between the ages of 50 and 60 years and at times as early as the age of 40 years. It is characterized by slowly progressive psychic changes such as impaired memory, confusion, excitement, restlessness, hallucinations and deterioration to the extent that the patient is nearly a vegetable. Often associated with the mental changes are abnormal neurological findings and convulsions. The brain shows generalized cortical atrophy of varying extent, but in true Alzheimer's disease, senile plaques and degenerative fibrillary changes in the ganglion cells of the cortex must be found on histologic examination. The cause of this condition is unknown.

In only a few of the 100 cases in the second series were the clinical conditions at all suggestive of Alzheimer's disease. Only 22 of the patients had personality deviations of any major degree, and 15 of the 22 were psychoneurotic. Only seven had mental deterioration. It is somewhat difficult to fit the other 78 cases into the picture of the precocious senility of Alzheimer, and even harder to reconcile them with descriptions of Pick's disease. The disease that was observed in those cases could be named the *idiopathic cerebral atrophy of the adult*. However, this does not accomplish much, for Alzheimer's disease is also idiopathic as far as present knowledge is concerned. Several authorities feel that the histologic changes in the brain, upon which the diagnosis of

Alzheimer's disease is made, are not specific for the disease and are found under other circumstances. At least one case was reported in a patient as young as 15 years. It is the author's conviction that most of the cases in the two series herein reported upon were not Alzheimer's disease. This applies especially to the second series, in which some of the patients had head injuries, others drank much spirits, three had had syphilis in early life (but had no indications of the disease at the time of the study). In a few cases vascular diseases may have been an etiologic factor, and no doubt a few of the patients had Alzheimer's disease. But what is the basic etiologic factor in the others?

It is altogether possible that the "Alzheimer's disease" in persons who can walk abroad has different clinical manifestations than the Alzheimer's disease that has been studied in institutions and has been recorded in the literature.

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# Spasticity

## Its Nature and Treatment

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AS THERE IS MUCH UNCERTAINTY as to the nature of spasticity, a good approach to the subject is to consider first some basic physiological facts. The development of the central nervous system is achieved through a continuous process of maturation, from the simple, as in a fetus, to the most complex, as in an adult. Each gain is accomplished by integration and control of the previous more primitive stage. Although it is possible to distinguish phases in this process, there are no demarcations; the various stages blend together.

From the middle of the seventh week of age, through birth, the human fetus responds to sensory stimulation with reflex movements, which at first are gross in nature, involving the entire body, and then become particularized and more specific. At about thirteen and a half to fourteen weeks the total pattern type of response practically disappears and is replaced by specific reflexes such as swallowing and finger closure.<sup>3</sup> In fact many of the reflexes of the newborn are present by that time and from then until birth become more vigorous, while new ones emerge.

Birth is merely an incident in the gradual development of behavior patterns. Whether it occurs chronologically at 27 weeks or in the normal period of gestation, birth does not result in the elimination of the fetal reflex responses. These continue to develop until they are suppressed by cortical impulses which traverse maturing corticospinal tracts. (This suppression is incomplete; many reflexes persist even through the adult stage.)

In disease involving the central nervous system, disintegration occurs in what Hughlings Jackson labeled "the hierarchy of the nervous system." Whereas in maturation, higher centers suppress lower ones, in disease the more complex and more voluntary functions are replaced by the more simple and the more automatic.

The hyperactive or pathological reflexes such as the Babinski, Oppenheim, Gordon, Chaddock, Schaefer, and Rossolimo reflexes not only indicate lesions of the central nervous system but are also physiological expressions of the release of reflexes from the control of brain centers or pathways damaged by disease.

*• There are a number of physiological means of relaxing spasticity, including active resistive exercise, cold hydrotherapy, heat, electrical stimulation of antagonistic muscles, passive stretch in diagonal movement patterns, and the Von Bechterew reflex. Although none of them will cure spasticity, temporary relaxation may permit a patient to achieve better functioning of an affected joint. The choice of procedure will depend on the nature of the lesion and the muscular distribution of the spasticity.*

The reflex is a behavior arc which involves theoretically a single segment of the spinal cord. It requires only a sensory neuron, an internuncial neuron and a motor neuron, or, if it is the stretch reflex, it involves only the sensory and motor neurons. In practice no reflex in the human is this simple. The most limited sensory stimulus calls forth a motor response from many segments of the spinal cord. For example, a pin-prick on the foot results in withdrawal of the whole leg, the muscles of which are innervated by many spinal cord segments. Even more complicated are the postural reflexes. Through stimulation of a number of discrete areas (semicircular canals and neck muscles, for example) the whole body responds to maintain equilibrium against the displacing pull of gravity. The conditioned reflexes are the most complicated, requiring the cortex for their development. They form the framework of habit patterns and learning.

In humans, when the spinal cord is transected the distal portion of the cord is released from the control of the rest of the central nervous system and responds with a very primitive flexion reflex to visceral, cutaneous and proprioceptive stimuli. This is labeled *spasm*, and its neuronal circuit occurs entirely by way of the spinal cord. It results in a spontaneous movement of the lower extremity which resembles the flexion phase of walking.

Frequently *spasticity* and *spasm* are thought of as synonymous, but the two should be distinguished. Their significance and the treatment of them are different. Whereas spasm is a stereotyped flexion reflex, spasticity manifests itself as an impedance to



passive movement. In normal persons with muscles at rest, it is possible to move the various parts of a limb with relatively little resistance through a range of motion which varies in extent from joint to joint. This is known as passive movement and depends on non-contraction of agonist or antagonist muscles, as well as on non-impedance by ligaments and synovial surfaces of the joints. Inactivity of muscle, in turn, depends on volitional relaxation by the patient, although this may not be achieved without previous training. At the end of the range, antagonists that are stretched respond with reflex contraction and impede further passive movement even though considerable force be applied.

In many patients with lesions of the central nervous system there is pronounced interference with such passive movement in ranges where no impedance occurs in normal persons. This may vary both in degree and nature. Some show constant rigidity of muscles in their shortened position so that passive movement is difficult to initiate. Some show interference in the center of the range and motion is impeded at one particular point and at no other. Some show alternate tightness and relaxation, the so-called "cog-wheel" effect. Many have limitation of passive movement at the end of the range. The different forms may all be present in the same person. In all types, interference is dependent on the speed of the passive movement as well as the positioning of the extremity.

In man and apes the extensor muscles are primarily affected, except in the arm where the flexors are involved. Frogs, which normally rest with flexed thighs, legs and arms, develop decerebrate rigidity in the flexor muscles. Pigeons, whose flexor muscles maintain the position of the wing at rest, exhibit rigidity in these same muscles. A generalization which accounts for the known muscular distribution of spasticity in most species is that it involves primarily the antigravity or equilibrium-maintaining groups of muscles.

Spasticity has been thought to be due to an increased sensitivity of the stretch reflex, but this is an oversimplification. In fact Kennard<sup>6</sup> demonstrated, following parietal ablation in monkeys, a heightened stretch reflex associated with flaccidity. Broadly and more accurately, spasticity may be described as an exaggeration of the postural reflexes due to the absence of some normal factors which control these reflexes. The hyper-reflexia is due not only to a release from inhibition, but to facilitation which is also a major factor.<sup>11</sup>

Spasm and spasticity may occur simultaneously. In the former, the reflex is relayed through the spinal cord; in the latter, a chain of reactions is set off involving many of the higher centers.

Decerebrate rigidity is a condition in animals

which is an exaggeration of a condition observed in spasticity in man. (As a matter of fact, Walshe<sup>14</sup> described a case of decerebrate rigidity in man.) When the cerebral hemispheres are removed from an animal, as was first done by Sherrington<sup>12</sup> in 1896, rigidity of the joints occurs as a result of static contraction of the extensor muscles, and the rigidity maintains the animal in the standing position. In decerebrate animals, the dependence of this condition on a number of higher centers is evidenced by the following: Stimulation of the medial anterior lobe of the cerebellar cortex results in suppression of spasticity, whereas, ablation of the same area produces an exaggeration of spasticity. Destruction of the vestibular nuclei or of the vestibulospinal tracts, or section of the afferent roots abolishes spasticity. Labyrinthectomy results in rigidity which is abolished by deafferentation and restored by ablation of the homolateral cortex of the anterior lobe of the cerebellum.<sup>1</sup> It is apparent that spasticity is dependent on a number of centers which directly or indirectly also have been shown to influence the maintenance of equilibrium. No one structure alone is involved; rather, a number working in a dynamic interrelationship help to maintain equilibrium, or, when damaged, to produce spasticity.

Spasticity is an important factor in neuromuscular disease. It is of clinical importance because it interferes with both passive and active movement. Since it does not remain static it tends either to improve or to become more severe. In patients with progressive disease, spasticity will increase, but even patients with a static corticospinal lesion may show progression of spasticity. The latter is evident in patients with hemiplegia due to cranial injury where flexor spasticity of the upper extremity may gradually restrict the range of movement until the arm is curled up against the chest, the wrist is in flexion and the fingers are tightly pressed into the palm of the hand.

Spasticity with resulting shortening of the range of motion leads to contracture which is an obvious handicap in utilizing a limb. An extremity immobilized by spasticity and contracture becomes a dead weight which interferes with the mobility of the rest of the body and is much more disabling than a limb that retains some flexibility even though voluntary function is lost.

Spasticity also interferes with practical recovery of voluntary motion of the antagonists. Many patients have spastic extensors of the knee and are unable to flex the knee against the spasticity. When these muscles are relaxed, voluntary knee flexor power is manifest. (It has been possible, in selected cases, to improve such initial slight voluntary power by relaxation of the spasticity and by utilizing facilitation techniques in physical therapy.) Thus,

spasticity is a deterrent to the full utilization of residual motor capacity.

It is incorrect to assume that spasticity is always harmful. Often extensors of the knee maintained in contraction by spasticity help keep a patient erect when relaxation of these same muscles, without sufficient voluntary power, results in collapse of the knees on weight bearing. Spasticity may also be of value in facilitating voluntary power in the spastic muscles themselves. Twitchell<sup>13</sup> pointed out that the first voluntary movements to appear following hemiplegia are themselves facilitated reflexes. He expressed the opinion that the problem at that stage is not so much to abolish the spastic reaction as to harness its diffuse hyperactivity.

A number of therapeutic procedures to alleviate spasticity have been suggested. Surgical treatment, often used, has had but limited success, and the only surgical procedures that merit discussion today are, first, Foerster's<sup>2</sup> method of posterior rhizotomy, and two other procedures, anterior rhizotomy and neurectomy. In the Foerster operation, alternate sensory roots are cut to remove excess afferent impulses which help maintain hypertonicity. This is in accordance with Sherrington's observation that deafferentation produces flaccidity in the decerebrate preparation. With this procedure, there is partial loss of function and some danger of substituting flaccid for spastic paralysis. Neurectomy is used where it is desirable to eliminate spasticity by cutting the motor nerve to selected muscles. By weakening the spastic muscles, the antagonists are freed and the contracture overcome. Such a procedure is of value in certain cases.

The use of drugs in relieving spasticity has received some study. Kabat<sup>4</sup> employed neostigmine and attributed its effect to action on the internuncial neurones. Other investigators suggested the use of agents that block the neuromuscular junction, such as curare or curare-like substances. Most recently, mephenesin has been employed with some success. The exact nature of its effect is not known but its action also appears to be primarily on the internuncial neurones.<sup>10</sup>

Actually, neither operation nor the administration of drugs has proved adequate for many of the patients under the authors' care who still retain useful voluntary muscle power but whose rehabilitation is limited by spasticity. Mephenesin is of value in such cases, although it is not well tolerated by some patients. Therefore, new methods of treatment for this condition have been sought and experiments with physiological methods for relaxing spasticity have been carried out. Heat was used at one time, but its value has been questioned.<sup>7</sup> Passive stretching also has been employed, although the intent was to prevent contracture rather than to relax spasticity.

In the studies by the authors the range of passive movement was measured with a goniometer before and after application of relaxation techniques. A statistically significant change in any of the measurements reflects a general decrease in spasticity. The goniometric measurement of the complete range of passive movement was employed because in spasticity there is frequently a pronounced limitation of this total range. When relaxation occurs, a measurable increase in range results and, simultaneously, a decrease in the amount of resistance to initiating the passive movement and in the resistance within the range takes place. Consequently, measurements of the total range indicate alterations not only in resistance to the initiation of movement but also in resistance to progression of movement. Although measurement of any one movement at any single joint is subject to considerable error, measurements of three different movements (as employed in the evaluations herein reported) are statistically more valid if they all vary significantly in any one direction. Multiple measurements were possible because relaxation extended to adjacent muscles and joints, permitting more than one movement to be tested for each procedure employed. The details of the goniometric studies have been published elsewhere.<sup>8</sup>

#### THE EFFECT OF ELECTRICAL STIMULATION ON SPASTICITY

The first physiological procedure studied and found of value was faradic stimulation of muscles antagonistic to those with spasticity. (Sherrington demonstrated a similar phenomenon in decerebrate animals.) In these studies a standard faradic stimulator was used and the active electrode was placed on various points of the antagonistic muscles, the most efficient point of contact being decided by the degree of relaxation. Details were reported in a previous publication on this subject.<sup>9</sup> An illustration of the procedure should be helpful. To relax spasticity in the quadriceps, the electrode is placed at various points on the hamstrings. When the current is applied, the knee is flexed by the therapist, whether with or without the voluntary participation of the patient depending on the degree of residual voluntary power. The amount of pressure exerted by the therapist is insufficient in itself to produce flexion unless relaxation occurs. The pressure serves two functions: It indicates when the electrical stimulation produces relaxation, and, when relaxation occurs, it facilitates the inhibition of spasticity by carrying the limb through its *maximum range of motion*.

There are many variations in procedure which depend on total patterns of movement. Relaxation of the quadriceps, in the foregoing example, cannot be isolated from relaxation of the whole leg. To achieve

this, many points are stimulated not only in the hamstrings but in muscles of the entire leg.

Since the quadriceps is not homogeneous but consists of a number of different muscles, there may be more than one way of relaxing extensor tightness at the knee. For example, one pattern of relaxation includes electrical stimulation of the gluteus maximus, the adductor magnus and the inner hamstrings, whereas in other patterns of relaxation the gluteus medius, the abductors and the outer hamstrings are stimulated. Precise details of the various patterns will be published elsewhere.

#### THE EFFECT OF COLD AND WARM HYDROTHERAPY ON SPASTICITY

It is frequently said that cold increases spasticity. The authors' experience has indicated, however, that immersion of a spastic limb in cold water (50° F.) for five minutes results first in flexor spasm and then in relaxation of both the temporary spasm and of the spasticity. The reported increase in tightness following exposure to cold may therefore refer to the flexor spasm rather than the spasticity. Immersion of the hand and wrist results in relaxation of spasticity in the fingers, wrist, and shoulder, although spasticity in the shoulder may increase slightly. Immersion of the foot and ankle results in relaxation of the entire leg. The use of cold is a simple procedure which has only one contraindication: In hemiplegia due to arteriosclerosis or hypertension, cold may set up a pressor effect, causing the blood pressure to rise suddenly. It is therefore important to either avoid cold in the treatment of spasticity in such circumstances or to employ it under carefully controlled conditions. In addition to cold water, the application of cold packs directly to the spastic muscles appears to be of value.

Heat is beneficial in certain types of spasticity. Immersion of the hand and wrist of a person with spastic hemiplegia in hot water (105° F.) for five minutes results in relaxation of the entire upper extremity. The use of heat, however, has very specific indications. It has been noted in the present study that patients with spasticity resulting from multiple sclerosis have increased leg spasticity when the foot and ankle are immersed in hot water. Further work is in progress to elaborate on this phenomenon.

#### THE EFFECT OF PASSIVE STRETCH AND EXERCISE ON SPASTICITY

Passive stretch in the form of the lengthening reaction quite obviously brings about relaxation of spasticity. This can be demonstrated, for example, in any patient with tightness in the extensors of the knee during initiation of flexion of the knee. Flexion

pressure exerted by the therapist will cause the knee to "jack-knife" suddenly. This is the characteristic lengthening reaction first observed by Sherrington.

The effect of passive stretch at the end of the range, which is intended primarily to increase the total range of movement, is less definite. The authors' experience indicates that passive stretch utilizing straight movements of the extremities is not as effective as passive stretch which permits the limb to be moved through a range simulating normal diagonal patterns of movement.

Active exercise decreases spasticity. This is especially true if the exercise is performed against resistance. The exercises should encourage contraction of the muscles antagonistic to those with spasticity. Facilitation techniques, previously described,<sup>5</sup> may be employed to build up power in these muscles.

#### THE EFFECT OF THE VON BECHTEREW REFLEX ON SPASTICITY

An example of a number of flexor reflexes which influence spasticity is the Von Bechterew reflex induced by plantar flexion at the metacarpophalangeal joint of the big toe. The mass flexion spasm which results produces relaxation of spasticity in the homolateral as well as in the opposite leg. In certain spastic patients a crossed extension reflex, in which relaxation in one leg is accompanied by an increase in extensor spasticity in the opposite leg, has been observed.

#### DISCUSSION

The exaggerated postural reflexes characteristic of spasticity are influenced by a number of physiological factors, including electrical stimulation of antagonists, active exercise, passive stretch, cold, heat, and associated reflexes.

Earlier work by Sherrington and others emphasized the importance of the afferent pathways in maintaining spasticity or decerebrate rigidity. If the sensory nerves are cut, decerebrate rigidity either decreases or disappears. The authors' investigations would indicate that the afferent pathways play an important role in controlling spasticity. In other words, not only is spasticity inhibited by higher centers, but afferent pathways assist in this inhibition at a segmental level.

In deciding which relaxation procedure is to be employed in any one patient, the site of the lesion and the degree and distribution of the spasticity are important.

None of the procedures reported upon herein will cure spasticity. The relaxation which occurs persists for varying periods of time depending on whether there is any alteration in functional movement of the patient following relaxation. In those in whom resto-

ration of voluntary motor function can be achieved, the relaxation assists in attaining this goal more rapidly, since spasticity may at times be a deterrent to slight voluntary motion. In other patients with static or progressively deteriorating lesions, the relaxation of spasticity will not persist after treatment is discontinued unless neuromuscular reeducation brings about a change in functional movement either through facilitation of preexisting motor potentialities or through mechanical facilitation of movement. If a patient has been totally incapacitated, and relaxation permits ambulation, even with the aid of devices, improvement in spasticity will persist as the result of the new dynamic balance between movement and spasticity.

In spite of the fact that there are cumulative effects from repeated relaxation, if the status of the patient in terms of functional movement does not change, relaxation will not persist after treatment is discontinued. However, if the relaxation technique is applied daily over an extended period, the reduction in spasticity will be beneficial in decreasing the disability and preventing contracture.

Where voluntary power permits, active resistive exercise is the procedure of choice for relaxation since it helps restore function as well. Of the other procedures studied, electrical stimulation is the most effective, for it gives the most complete relaxation and, if done with skill, can be used to give relaxation where it is specifically needed.

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# A Device for Prophylaxis of Acoustic Trauma

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THAT ACOUSTIC TRAUMA is an important industrial problem is obvious to any otologist, yet prophylaxis of injury of that kind has been extremely perplexing. Ear plugs of various types have been introduced but they have not been widely used as prophylactic devices because they impair the hearing for conversational voice while protecting against the concussion of occupational noises. Other "ear protectors" have afforded little or no protection.

A study was made to determine the possible prophylactic effectiveness of the Lee Sonic Ear-Valv,<sup>®</sup> which is designed to control the amount of sound entering the ear, admitting conversational tones but barring damaging noises. The ear valve is diagrammed in Figure 1 and the component parts are shown in Figure 2.

The portion that is inserted is a hollow stem set in an ear-stopper made of silicon. It is designed to fit snugly but comfortably into the ear canal, to hold the unit in the ear and to direct sound through the hollow stem. The cylinder contains the many parts of the mechanism for controlling sound pressure, and in it is a small opening for the sound waves to

• Tests were made to determine whether protection against acoustic trauma was afforded by an ear-plug containing a valve designed to close under pressure of intensive noise.

The hearing acuity of 34 persons was determined before they participated in target practice on a pistol firing range. Eighteen of them then wore the ear-plugs on the range and 16 did not. Hearing acuity was again determined after the target practice and it was noted that the loss of acuity was considerably less in subjects who had worn the plugs than in those who had not.

enter. The intensity of sound is controlled by a valve which is suspended equidistant between two seats by two concentric springs.

This valve divides the passage through which sound must pass, so that the sound waves move the valve back and forth between the seats. The louder the sound pressure, the more the valve is displaced. Since sound waves are alternate, this displacement

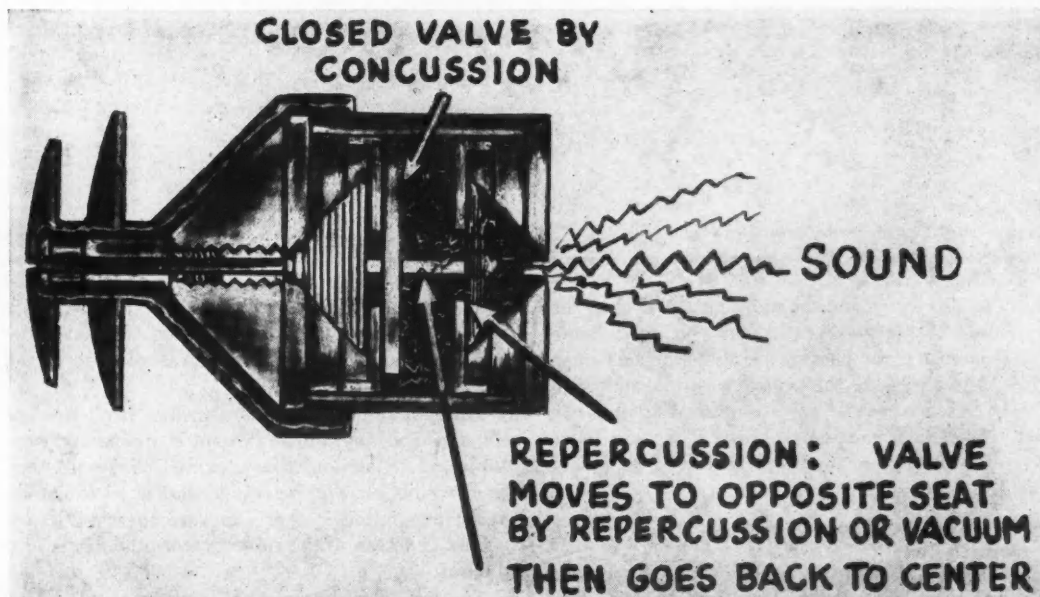


Figure 1.—Diagram illustrating the movement of the valve with diphasic sound waves.



Figure 2.—The component parts and full assembly of the Ear-Valv.

TABLE 1.—Audiometric Disparity in Hearing After Firing Compared with Test Before Firing

*Without Ear-Valv*

	Decibels										
	125	250	500	1000	2000	3000	4000	6000	8000	12000	Totals
1.....	-5	0	+5	0	-5	-10	-25	-35	-35	-30	-140
2.....	+5	+5	+5	+10	+15	-10	0	-15	-20	-35	-35
3.....	0	+5	+5	+15	-5	-5	0	-15	-25	0	-25
4.....	-10	-5	+5	+5	0	0	-10	-20	-30	-25	-90
5.....	-5	0	-5	0	0	0	-5	-5	0	-15	-35
6.....	0	+5	+5	+5	-5	0	-15	-15	-50	-20	-90
7.....	-10	-5	-5	-10	-10	0	-20	-10	-20	-10	-100
8.....	0	-5	-5	-5	-5	-10	-5	-25	-25	-35	-120
9.....	-5	-5	-5	-5	-5	-5	0	-10	0	0	-40
10.....	-10	-5	+5	+5	0	+5	-35	-10	-15	-15	-75
11.....	+5	+5	+5	+5	+5	+10	0	0	-10	0	+25
12.....	+10	+15	+10	+5	+10	0	0	+5	+5	0	+60
13.....	-5	0	-5	-10	0	+5	0	0	-5	-10	-30
14.....	+5	0	-5	-5	0	0	+5	-5	0	-5	-10
15.....	-10	-10	0	-5	0	0	-5	-5	-5	-10	-50
16.....	+5	+5	+5	0	0	-10	-10	0	-15	-20	-40
Average total loss in decibels (unprotected subjects).....											49.7

*With Ear-Valv*

	Decibels										
	125	250	500	1000	2000	3000	4000	6000	8000	12000	Totals
1.....	0	0	+10	0	-5	-5	0	+5	-5	-10	-10
2.....	+10	+10	+5	+5	+5	0	0	+10	-25	0	+20
3.....	+5	+10	-5	-5	0	+5	0	-5	+5	-15	-10
4.....	0	+10	+10	0	0	+5	0	-5	0	+10	+35
5.....	0	0	0	0	+5	+5	+15	0	-5	-30	-10
6.....	+10	0	+5	+5	+5	+5	0	+5	-5	-10	-20
7.....	0	0	0	-10	-5	-5	0	0	0	-5	-25
8.....	0	+20	+25	+5	+5	-15	-10	-10	-5	+5	+20
9.....	+5	0	-5	+5	-5	-5	0	-10	-10	-15	-40
10.....	-10	0	0	0	0	+5	-5	+5	+5	-10	-10
11.....	-5	0	0	0	+5	+5	-5	+5	+5	-10	-10
12.....	+10	0	+10	-5	0	0	0	0	0	-15	-20
13.....	+5	0	+5	0	+5	+5	0	+5	+5	-5	+25
14.....	+5	+5	+15	+15	+10	0	+10	0	+5	0	+65
15.....	0	0	0	0	0	0	+5	-5	0	+10	+10
16.....	-5	-5	-5	-5	0	+5	-5	-5	-10	+5	-30
17.....	-10	-5	-10	-5	+5	+5	+5	-10	-5	+5	-25
18.....	-5	0	0	0	+5	+5	0	0	0	0	-5
Average total loss in decibels (subjects using Ear-Valv).....											1.9

is in two directions and the movement is cyclic. The amplitude of the valve excursions varies with the sound intensity, the passage being completely open when the valve is in the central position and completely closed when the valve is pushed against one seat by a sharp concussive noise. Thus the valve closes the passage to loud and harmful pressure of sound.

**METHODS OF TESTING**

The testing of ear protectors by physical methods is difficult and the results controversial. Most techniques employ pure tones. However, since for prac-

tical purposes the concern is with "white noise," it was decided to use a "field testing" method to determine what protection, if any, was afforded by the Lee Sonic Ear-Valv.

Thirty-four undergraduates in the Naval Reserve Officers Training Corps unit at a university were subjected to audiometric examination before they fired pistols on a firing range and were examined again five minutes after exposure to firing range noises. Eighteen of the subjects wore the device; 16 did not.

The test weapons were .45 caliber pistols. Each subject fired ten rounds in the subterranean firing

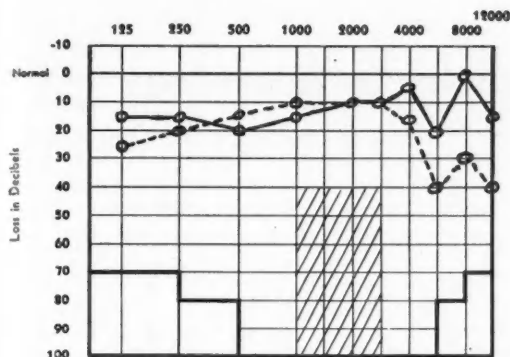


Chart 1.—Audiogram considered typical from the control group not wearing the Ear-Valv. Solid line represents hearing before firing and the dotted line represents hearing after. The two tests were essentially the same except for the characteristic loss in the high tones due to acoustic trauma. This chart was of the tests of Subject No. 4 in the control group.

range of the armory on the university campus. The noise level at the time of firing was measured to exceed 120 decibels. No spectral analysis of the noise was attempted. All the patients had been otoscopically examined before the tests and were observed to have normal membrana tympani. They were examined again after firing, and in neither group was there any visual evidence of trauma to the ear.

All audiograms were taken on one recently-calibrated audiometer, all by the same audiometrist and all under the same conditions. Three threshold determinations were made at each point on the audiogram. All test subjects were exposed to exactly the same amount of gunfire for sixty seconds, and all were familiar with the audiometer, having been tested previously for midshipman examinations. They were all between eighteen and twenty-one years of age.

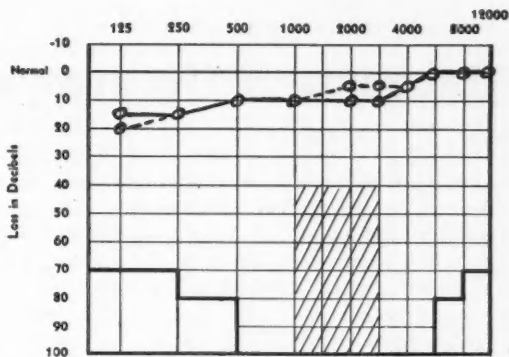


Chart 2.—Audiogram considered typical from the protected group wearing the Ear-Valv. The two tests are essentially the same demonstrating no loss after exposure to acoustic trauma. This chart was made from the results of tests of Subject No. 18 in the protected group.

#### RESULTS

The results of audiometric tests before and after firing are shown in Table 1, and the greater loss of hearing acuity among subjects who did not wear the Ear-Valv than among those who did indicates the device does protect against the trauma of intense sound. It was spontaneously reported by many of the subjects that there was pronounced relief from the usually painful noise of the .45 caliber pistol.

The accompanying audiograms (Charts 1 and 2) are considered typical of the tests with and without the Ear-Valv.

The Lee Sonic Ear-Valv is manufactured by the Sigma Engineering Company, 1491 North Vine Street, Hollywood 28, California.

The author wishes to express his thanks for the cooperation of Captain Burnett K. Culver, USN, Commanding Officer, and Major Robert M. Ervin, USMC, officer in charge of the firing range.

9754 Wilshire Boulevard.

# The Value of Electromyography in Neurology

A. A. MARINACCI, M.D., Los Angeles

GALVANI in 1791 observed from studies of neuromuscular sections of frogs' legs two fundamental principles: that muscle contracts when stimulated, and that an electrical current is generated during such contraction.

In the light of today's knowledge it is proper to assume from Galvani's observations that the current produced during the contraction of muscle is the electrical counterpart of the motor unit action potential that is generated during voluntary contraction.

Schiff in 1851 dissected the hypoglossal nerve of the tongue of a dog and observed fibrillation of the affected muscle five days later. He further demonstrated that fibrillation is the result of nerve degeneration and ceases as the nerve regenerates.

From Schiff's discovery it is concluded that denervated muscle fibrillates because it has been disconnected from its nerve supply, and that fibrillation ceases either when the nerve is regenerated or when the muscle has undergone fibrosis.

Denny-Brown and Pennybacker<sup>1</sup> reported observing the fibrillation of denervation both in experimental animals and in human beings with amyotrophic lateral sclerosis. They observed that the denervated fibers fibrillate independently.

Weddell, Feinstein and Pattle,<sup>10</sup> the first to apply electromyography in clinical neurology, were able to localize the lesion and follow the course of nerve regeneration in a number of neurological conditions.

Jasper and co-workers<sup>5</sup> also applied electromyography in studies of peripheral nerve regeneration and in studies of poliomyelitis and other diseases of the lower motor neurons. Huddleston and Golsseth<sup>4</sup> in 1948 reported upon the value of electromyography in poliomyelitis, and Kugelberg and co-workers<sup>6</sup> found the method useful in the diagnosis of muscular dystrophy. The author<sup>7, 8</sup> has reviewed the clinical use of electromyography in 2,500 cases.

## Nerve Injuries

Electromyography in nerve lesions indicates the degree of involvement. If the nerve is completely cut only fibrillation is recorded; no motor unit potentials are generated. In partial lesions, portions of the muscle show fibrillation while in other portions motor units are generated by voluntary efforts.

From the Department of Electromyography, Hospital of the Good Samaritan, the University of Southern California School of Medicine, and the Los Angeles County General Hospital, Los Angeles.

Presented before the Section on Psychiatry and Neurology at the 82nd Annual Session of the California Medical Association, Los Angeles, May 24-28, 1953.

*• By detection of muscular fibrillation, a sign of motor nerve impairment, through electromyography, diseases of the motor nervous system can be distinguished from muscular disorders, malingering, and psychoneurotic states. The site of lesion can be determined and the degree of impairment and progress of recovery can be estimated. The method has been used successfully in amyotrophic lateral sclerosis, poliomyelitis, peripheral neuritis and neuro-nitis, and root compression syndrome, as also for indirect evidence in muscular dystrophy and other myopathic conditions.*

The degree of fibrillation indicates whether the lesion is minimal, slight, moderate, severe or complete.

## Nerve Regeneration

The electromyogram has proved to be of great diagnostic and prognostic value in determining the rate of nerve regeneration not only after repair but also in lesions regenerating without repair. Regeneration of the nerve after serum plexitis, neuronitis, neuritis and other reversible conditions of the lower motor neuron also can be followed electromyographically. In many cases nerve regeneration can be detected from four weeks to four months before detectable clinical recovery.

## Degenerative Diseases of the Spinal Cord

In early amyotrophic lateral sclerosis, when there may be no other clinical symptoms than, for example, wasting of the hand, an electromyogram may indicate not only fibrillation in both upper extremities but also the beginning of axon interruption in both lower extremities signifying diffuse progressive degeneration of the lower motor neurons.

The electromyographic finding in multiple sclerosis is usually diffuse spotty fibrillation of denervation. In some cases other effects may be suspected; for example, although only the muscles of the hand are affected, lower motor neuron disease may be suspected, but the electromyogram may indicate only peripheral nerve involvement.

By revealing progressive degenerative disease of the spinal cord in the earliest stage, the electromyogram often makes it possible to relate to the organic changes symptoms that otherwise might be attributed to hysteria or psychoneurosis.



### *Infectious Disease of the Lower Motor Neuron*

In anterior poliomyelitis it can be definitely determined from the electromyogram what specific group of muscles is affected and the extent of denervation. This information is important in planning physical therapy, which is advisable in partial denervation. The same is true in peripheral neuritis or neuronitis.

### *Root Compression Syndrome*

It should be emphasized that root compression syndrome cannot be diagnosed by electromyography unless fibrillation is present throughout a group of muscles innervated by one myotome, or root. For example, in involvement of the fifth cervical root the fibrillation would be present not only in the anterior primary division but also in the posterior primary division—in the sacrospinalis between the fourth and fifth cervical vertebrae, in the rhomboid, the supra-infraspinatus, the deltoid, the biceps and the brachioradialis. A few fibrillations and polyphasic motor impulses observed only in the brachioradialis and the deltoid would not justify the diagnosis of root involvement.

In localizing root involvement of the lumbosacral region it is necessary to test the entire myotome. If the first sacral root were involved, fibrillation and abnormal motor units would be detectable in the gastrocnemius, the hamstrings, the gluteus maximus and the erector spinalis between the first and second sacral vertebrae. As in the example above, a few indications of fibrillation in the gastrocnemius and the hamstrings would not be diagnostic. Electromyographic abnormalities are most pronounced in cases of definite insult to the root that causes relatively definite and prolonged disability; only slight changes or none at all may be shown in cases of temporary attacks causing little disability.

Shea, Woods and Werden<sup>9</sup> found electromyography of great help in root compression syndrome in conjunction with neurological examination and myelography with Pantopaque.<sup>8</sup> The method may also be useful when studies with Pantopaque indicate doubtful abnormality or none. The electromyogram identifies the site in about 90 per cent of cases when the fifth lumbar disc is involved and only slightly less when the fourth disc is the site. It has been found that the diagnosis of root compression syndrome is much more frequently confirmed when both electromyography and Pantopaque myelography are used than when either is used alone.

### *Myopathic Conditions*

In muscular dystrophy the recorded impulses are not only more faint but also shorter, varying from 1 to 2 milliseconds and up to 150 microvolts; but they do not diminish in proportion to the degree of atrophy, because gradual destruction of the individual muscle fibers reduces the size of the motor unit;

when the patient is completely relaxed there is no fibrillation of denervation.

In neurogenic disability the interruption of the axon puts the entire unit out of action, whereas in myopathosis the muscle fibers separately cease to function. The motor impulses remaining in neurogenic disability, therefore, are usually of higher voltage, of longer duration and less frequent than in myopathy, and it may even be difficult to detect them, while in myopathy they are clearly discernible by electromyography and numerous in relation to the degree of muscle atrophy.

In myotonia the burst of impulses may continue for 30 to 50 seconds, but there is no fibrillation. In myasthenia gravis there is first a burst of impulses activated by voluntary efforts diminishing in size, amplitude and frequency in a short period because the patient cannot maintain them. In myasthenia gravis, Prostigmine<sup>®</sup> causes a temporary reversion toward normal motor impulses.

Electromyograms may be accepted as conclusive evidence of poliomyelitis in persons desiring to qualify for assistance from a poliomyelitis aid fund. Also, muscular dystrophy is sometimes distinguished from either poliomyelitis or upper or lower motor neuron disease by electromyography. Other distinctions possible are those of primary muscle atrophy from progressive spinal muscular atrophy; late distal myopathy from peroneal spinal muscle atrophy (Charcot-Marie-Tooth type), and proximal myopathy from proximal spinal muscular atrophy. In conditions in which muscular dystrophy is combined with disease of the lower motor neuron the relative importance of each can be determined.

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# Pseudomyxoma Peritonei

ROLAND G. FRANKLIN, M.D., San Diego

EVERY ONCE IN A WHILE a surgeon is confronted with a situation in the operating room wherein he is not thoroughly familiar with the pathological condition which presents itself. This is most likely due to the relative infrequency of occurrence of the disease in question. Such a situation may arise in the case of pseudomyxoma peritonei.

Pseudomyxoma peritonei was first recognized, and named, in 1884 when Werth published an article on the disease. Frankel, in 1901, was the first to recognize that the disease could arise from the appendix rather than exclusively from an ovarian tumor as was previously believed. Since that time, occasional articles on the subject have appeared in the literature, each emphasizing some phase of the disease and most of them presenting illustrative cases.

Pseudomyxoma peritonei may be defined as "a condition of the peritoneum in which gelatinous pseudomucinous and/or mucinous material are distributed over its surface either as a homogenous layer or as multiple cystic masses."<sup>2</sup> These masses may penetrate every part of the peritoneal cavity and may completely fill the cavity so that disturbance of bowel function results. The material, which is sticky and gelatinous in consistency and of yellow or brown color, has often been described as resembling frog's spawn. There may be variations in the gross appearance and in the reaction of the peritoneum to its presence. At times the color is gray, white, or brown, the shade depending upon the amount of hemorrhage or fatty material present. Often the gelatinous masses are in the form of huge cysts, some of which connect one limb of the bowel to another. In the great majority of cases the mucinous material originates in either the appendix or the ovary. Some investigators have reported, however, that the disease may arise from less common sources such as omphalomesenteric cysts.<sup>2</sup> At any rate, in order to account for the presence of mucinous material in the peritoneal cavity there must be a rupture of an organ or viscus which contains cells capable of secreting the substance. These organs are principally the ovary and the appendix. Each of these organs may be involved by a pathological condition in which cyst formation occurs. The result in the appendix is mucocoele; in the ovary, pseudomucinous cystadenoma.

*• Since it closely resembles widely metastatic intra-abdominal cancer, pseudomyxoma peritonei should always be thought of in cases in which apparently hopeless malignant disease appears to be present. The disease is not often malignant and surgical treatment is palliative in many cases and curative in some.*

*Therapy consists of the removal of the appendix in males and of the appendix and ovaries in females.*

A mucocoele of the appendix is described as resulting from obstruction at its base, usually from inflammation and scarring or kinking. The mucous cells lining the appendiceal lumen continue to secrete, and the accumulation of mucinous material results in distention of the organ and the formation of a mucocoele. The cysts are usually small but they may become huge. With rupture of the cyst, the thick tenacious mucinous material is extruded into the peritoneal cavity. Supposedly, mucous-secreting cells that are extruded implant themselves and continue to grow and secrete to produce small and large cysts which in turn may rupture and spread the disease further in the peritoneal cavity.<sup>5</sup> Some investigators have expressed the opinion that pseudomyxoma of the peritoneum is not a result of the presence of secreting cells themselves in the peritoneum, but rather comes about through the irritating effect the secretion has on the peritoneum.<sup>1</sup> The relative rarity of the observation of viable mucous-secreting cells in the pseudomyxomatous material supports that opinion.

A similar situation obtains in the ovary, with the disease resulting from a rupture of pseudomucinous cystadenoma of the ovary. Pseudomyxoma is usually of ovarian origin, according to most investigators. However, in some cases it may be difficult to determine whether the disease is of ovarian or of appendiceal origin. Disease may occur from both sources simultaneously. Chaffin and Le Grand,<sup>1</sup> attempting to differentiate the two on clinical and chemical grounds, noted that a greater degree of malignancy was associated with pseudomyxoma peritonei of ovarian origin and that the exudate was alkaline, whereas the exudate in cases of appendiceal origin

was acid. Most investigators have been unable to confirm this chemical distinction and have noted that the pH of the material varies with individual cases.

It is of greatest clinical importance to determine the actual source of the disease, the degree of malignancy that exists if any, and the most effectual form of therapy. Generally the disease cannot be diagnosed without opening the abdomen. In males the disease almost always arises from mucocele of the appendix, but if the disease is present and the appendix not involved, other less common sources—gall-bladder wall cyst, remnant omphalomesenteric cysts—should be investigated. In females the ovaries should be inspected, and if they are not involved attention should then be directed to the appendix, and if the appendix is uninvolved the less common sources should be searched for as in the male. The origin of pseudomucinous cystadenomas of the ovary is not entirely clear, but an accepted explanation is that this condition arises from a teratoma in which the tall columnar endoderm epithelium overrides the other teratomatous elements.<sup>4</sup> The epithelium of the pseudomucinous cysts of the ovary and mucocele of the appendix is identical.

That pseudomyxoma of the peritoneum can result in death is without question. However, death may be caused not by malignant growth but by mechanical complication arising from the presence of pseudomucinous material. One of the common complications resulting from this disease is the development of fistulous tracts between the cysts and the bowel. Cases have been reported in which death resulted from intestinal obstruction due to the large masses of pseudomucinous material in the peritoneal cavity and to the presence of large pseudomyxomatous cysts obstructing loops of bowel. Most often scarring associated with long standing pseudomyxoma peritonei causes obstruction of the intestinal lumen.<sup>3</sup> Masson and Hamrick reported one case in which the patient died in a condition of jaundice and they expressed belief that obstruction of the extrahepatic biliary tree resulted from pseudomyxoma peritonei.<sup>3</sup> Chaffin and Le Grand suggested that small bowel infarction might occur owing to impaired portal venous return caused by compression of the mesenteric veins by packed exudate. All investigators have indicated that in the presence of pseudomyxomatous disease the peritoneum is prone to infection. Extreme care must be taken in removal of the appendix, for the appendiceal stump is more likely to break open than it would ordinarily be.<sup>1</sup>

Probably the most important factor to consider is the presence or absence of malignancy in this disease. Chaffin and Le Grand stated that colloid carcinoma of the gastrointestinal tract is readily distinguishable from pseudomyxoma peritonei resulting from ovarian or appendiceal disease. They found

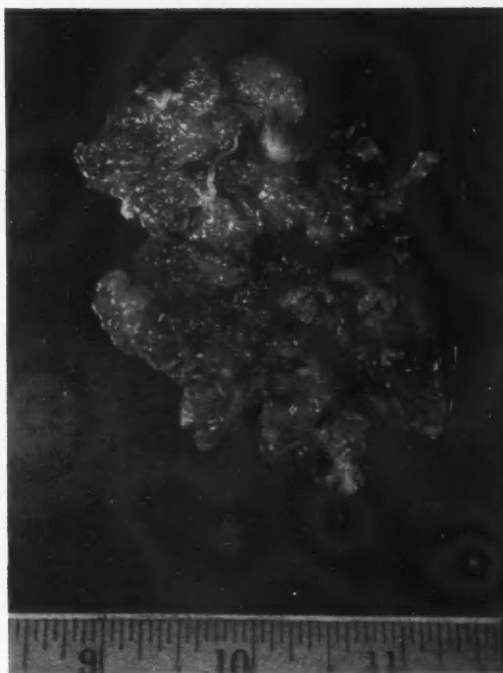


Figure 1.—Gross appearance of pseudomucinous material "frog's spawn" obtained from abdominal cavity of a patient with pseudomyxoma peritonei.

no record of an instance in pseudomyxoma peritonei concomitant with malignant disease of the gastrointestinal tract. They pointed out that colloid carcinoma is distinguishable by the finding of definite clinical evidence of a primary lesion in the gastrointestinal tract, by the absence of a large quantity of freely floating "frog spawn exudate," by the finding of visceral metastasis, and by histologic evidence of malignancy.

In about half the cases of pseudomyxoma peritonei malignant cells can be observed microscopically, but the obvious evidences of cancer (mitotic figures, metastasis, bizarre cell arrangements, etc.) are usually not present<sup>5</sup> and pathologists may disagree as to whether the condition is or is not cancerous. The prognosis is fairly good. Many patients live for years if properly treated and some are cured. Fundamental in therapy is the removal of the source of the disease—in general, the appendix in males and the ovaries and appendix in females. At the same time, as much as possible of the pseudomucinous material should be removed. Rosenfeld,<sup>5</sup> in the firm belief that possibly all cases of pseudomyxoma arise from the appendix, advocated appendectomy in all cases, even those in which the ovaries are apparently the primary source of the disease and even though the appendix appears free of disease. All reports indi-



Figure 2 (Case 1).—Mucocoele of appendix, gross appearance and cross section; ovarian tissue with pseudomucinous excrescences.

cate prolongation of life when both the possible sources of the disease have been eradicated. Most observers have indicated that postoperative irradiation is helpful. In many cases pseudomyxoma is mistaken for a spread of carcinoma from some intra-abdominal source and operation is considered hopeless. However, if the disease is recognized for what it is, palliation and perhaps cure can be obtained by surgical treatment, whereas otherwise the patient may go on indefinitely with an unrecognized non-malignant condition. Rosenfeld cited such an instance.

#### REPORT OF A CASE

A married woman 52 years of age complained of "gaseous indigestion," increasing pain in the right lower quadrant of the abdomen of three weeks' duration, and anorexia. The patient had had cesarean sections 14 and 17 years ago. She had complained of pain in the back for years.

Upon physical examination it was noted that the uterus was about twice normal size. There was left adnexal thickening and a mass about 6 cm. in diameter on the right side of the abdomen.

Total hysterectomy, bilateral salpingo-oophorectomy and appendectomy were carried out. Multiple mucinous excrescences were scattered over the pelvic peritoneum and omentum. The appendix was 7 x 2.5 cm. and on section it was observed to be a large cyst filled with grayish-white mucinous material (see Figure 2). The cyst was lined by a yellow wall and there was a point of rupture at the tip. Microscopically it was observed that the lining of the cyst was tall columnar epithelium. There were multiple small excrescences over the surface of the uterus and ovaries. None of the cells appeared malignant.

When last observed, 30 months after the operation, the patient was well. The body weight was static and no abnormalities were noted in a pelvic examination.

2290 Sixth Avenue.

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# CASE REPORTS

- Cortisone and Thyroid Hyperplasia
- Hemophilus Influenza Epiglottitis in a 12-Year-Old Child
- Acute Ulcerative Colitis Due to Klebsiella

## Cortisone and Thyroid Hyperplasia

HALL G. HOLDER, M.D., and  
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MOST OBSERVERS AGREE that in normal humans and rats, administration of cortisone depresses function of the thyroid gland,<sup>2,4,6,7,9,12,14,16,17</sup> as measured by a diminished uptake of  $I^{131}$  and a decrease in the serum content of protein-bound iodine. Whether the diminished thyroid function is the result of reduction in the amount of thyrotropin secreted by the pituitary, of interference with the utilization of thyrotropin, or of interference with the synthesis of thyrotoxin within the thyroid gland itself, or is due to other factors, is not yet clear.<sup>1,2,6,14,15</sup> It should be noted that some investigators question that cortisone depresses thyroid function,<sup>3, 8, 11</sup> and O'Neal and Heinbecker<sup>13</sup> have expressed doubt that it has any effect on the gland whatever. Because of the calorogenic action of cortisone, the basal metabolic rate may be reduced, normal or increased after cortisone therapy.<sup>7, 10</sup>

The authors know of no report in the literature of goiter arising during the course of treatment with corticotropin (ACTH) or cortisone. That occurred in the case here reported, but it is emphasized that a causal relationship between cortisone and goiter, although likely in this case, is unproven.

The patient, a housewife 47 years of age, consulted an allergist in November 1951, because of nasal congestion, mucoid nasal discharge and occasional sneezing for four years. Since the onset of a "head cold" in 1947, a troublesome non-productive cough had persisted. Occasional migraine had responded to Benadryl.<sup>®</sup> Examination showed a condition interpreted as allergic rhinitis. Intradermal skin tests were only mildly positive to environmental materials, foods and bacteria and were negative to pollens and molds. The tonsils had been removed. There was no evidence of sinusitis, and the ears were normal. The lungs were clear. No abnormality had been observed in an x-ray film of the chest in 1949. There was no enlargement of lymph nodes. The blood showed no eosinophilia. A beta hemolytic

streptococcus grew on culture of material taken from the throat.

For the ensuing year, up to November 1952, the patient took potassium iodide (enteric coated), 0.3 gm. three times daily; thereafter, twice that amount daily until July 1953. No improvement was noticed from the iodine, but the patient was considerably better when she restricted or stopped smoking. Exacerbations occurred when the weather turned foggy or damp. In October 1952 the patient was sometimes awakened at night by the dry cough, and it was decided to try cortisone. The first day, 200 mg. was given by mouth in divided doses, the second day 100 mg., and diminishing doses thereafter until a maintenance daily dose of 12.5 mg. was reached in four weeks. Thereafter, for eight and a half months, until July 1953, the patient took from 12.5 to 37.5 mg. of cortisone daily, the dose varying according to the severity of symptoms.

In April 1953, the patient noticed a swelling in the neck. Upon examination on May 11, symmetrical enlargement of the thyroid gland was noted. There was some question of nodularity, but no tenderness, and no evidence of toxicity. The blood pressure was 120/80, and the heart was normal. Measurements of the circumference of the neck were as follows: May 11, 37 cm.; May 18, 35.5 cm.; May 25, 35.5 cm.; June 2, 34 cm.; June 22, 37 cm. On the last date, the patient complained of tightness in the neck and persistence of dry cough. The thyroid gland felt firmer, and for the first time puffiness was noted around the eyes. It was interpreted as being due, perhaps, to early myxedema. It was thought likely that the cough was due to pressure of the thyroid gland on the trachea. On June 24, 1953, the basal metabolic rate was minus 10, minus 15.

In preparation for operation, treatment with cortisone and potassium iodide was discontinued and corticotropin was injected intramuscularly in daily dosage of 20 units of Acthar<sup>®</sup> on July 7, 8, 9, 10, 13 and 14, 1953. The patient was admitted to hospital July 14. A roentgenogram of the chest showed no substernal goiter or other abnormality. The patient noted respiratory pressure symptoms with the neck either extended or flexed. She thought there had been a gradual change in pitch of the voice but no

From the Surgical Service of the Scripps Memorial Hospital, La Jolla.

definite hoarseness. A diagnosis of bilateral, multinodular, non-toxic goiter was made.

The blood pressure was 140/82 and the pulse rate 78. Results of urinalysis were within normal limits. Erythrocytes numbered 4.75 million per cu. mm. of blood and the hemoglobin value was 96 per cent. Leukocytes numbered 20,400—82 per cent segmental cells, 4 per cent stab forms and 14 per cent lymphocytes. The result of a Kline test was negative.

Subtotal thyroidectomy was carried out and the gland was observed to be symmetrically enlarged, homogeneous and relatively avascular. Pressure symptoms were relieved by operation and the voice returned to its normal pitch. Puffiness about the eyes was accentuated for several days after operation, then receded and in two weeks disappeared. On September 23, 1953, the basal metabolic rate was minus 4, minus 12.

**Pathologist's report.** The tissue removed weighed 35 grams. The gross section was reddish gray, uniform, and of beefsteak consistency throughout. Microscopic sections from four different areas showed small acini, which for the most part were empty and lined by tall epithelial cells (Figure 1). Many acini contained papillary infoldings. The epithelial cells appeared to be actively secreting an eosinophilic, amorphous material. The stroma was sparse and there was no lymphocytic infiltration whatsoever. A diagnosis of primary hyperplasia was made.

#### DISCUSSION

Although no similar clinical case has been recorded, Halmi and Barker<sup>5</sup> in August 1952, showed photomicrographs of hyperplastic thyroid tissue removed from rats which had been injected with 2 to 5 mg. of cortisone daily over periods of from 20 to 83 days. Pair-fed control animals showed no hyperplasia. More recent experiments by O'Neal and Heinbecker<sup>13</sup> did not confirm the results of Halmi and Barker. The subject is confused by variations in the conditions in experiments, such as differences in the iodine content of the diet, and by the oftentimes grossly excessive doses, by body weight, of corticotropin or cortisone given to the animals as compared to doses for humans.

#### SUMMARY AND CONCLUSION

Hyperplastic goiter occurred in a woman who was under prolonged treatment with cortisone for allergic rhinitis. There was no evidence of hyperthyroidism, but the histologic appearance of a portion of the gland removed resembled that of primary hyperplasia. Similar histologic structure was noted by Halmi and Barker<sup>5</sup> in rats under treatment with cortisone.

It is suggested that there may have been a relationship between cortisone therapy and the development of goiter in the case reported. Because of the current state of ignorance concerning this possible relationship and in light of the possibility that sim-

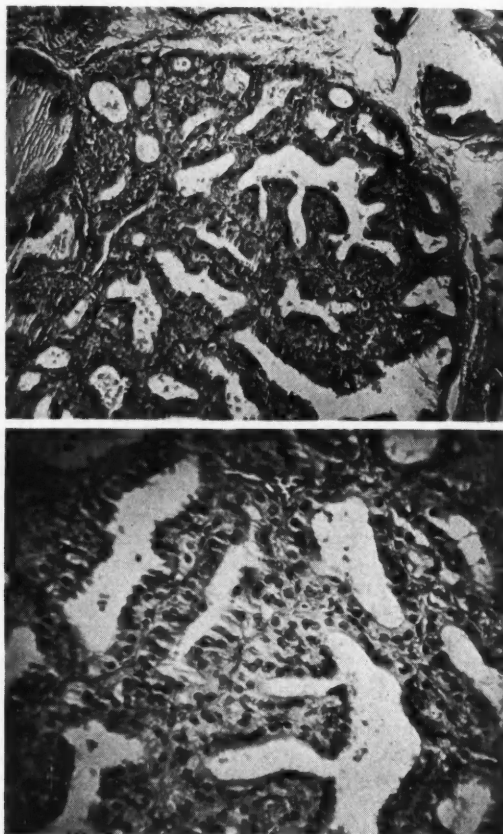


Figure 1.—Hyperplasia of thyroid gland, hematoxylin-eosin stained, green filter. Upper,  $\times 100$ ; lower,  $\times 225$ .

ply discontinuing hormonal therapy might bring relief, surgeons should be slow to remove diffuse goiters arising in similar circumstances.

2330 First Avenue.

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## Hemophilus Influenza Epiglottitis in a 12-year-old Child

KURT M. GUNDELL, M.D., Whittier

A 12-YEAR-OLD BOY was admitted to the communicable disease unit of the Los Angeles County General Hospital because of difficulty in swallowing and breathing of one day's duration.

The patient had been entirely well until two days before admittance when he noted a slight stiffness of both legs which subsided the same day. The following day fever, sore throat and general malaise developed. When he awoke on the morning of the day of admittance the patient noted, in addition, pronounced difficulty in breathing and swallowing. At times he gasped for air but was not cyanotic. When he attempted to swallow water it was forced out through the nose. There was no headache, backache or peripheral weakness, and no visual disturbances were noted. A physician who had examined the patient referred him to the hospital with a provisional diagnosis of bulbar poliomyelitis. So far as could

From the Los Angeles County General Hospital, service of A. G. Bower, M.D., chief of Communicable Disease Unit.

be determined the patient had not been in contact with anyone having a communicable disease.

Except for eczema in infancy and allergic rhinitis in childhood, the patient had always been in excellent health.

When examined upon admittance he was observed to be mentally oriented, acutely ill and in pronounced respiratory distress, but not cyanotic. He preferred sitting up to reclining, and the mouth was kept open. Swallowing was difficult and painful. The voice was moderately hoarse, but there was no stridor. The temperature was 103.8° F., the pulse rate 126 and respirations 30 per minute. The blood pressure was 120/80 (mm. mercury).

The skin and mucous membranes were normal and there were no palpable nodes. The throat was bright red. No pooling of secretions was noted. The gag reflex was not impaired. Only on indirect laryngoscopy was the epiglottis visible. It was red and edematous. There was no formation of membrane about it. The neck was supple, but there was pronounced tenderness along the anterior cervical chain.

Upon examination of the chest, moderate intercostal retractions were noted and there was occasional use of the accessory muscles of respiration. Aeration was poor (vital capacity 525 cc.), but the lungs were clear except for transmitted rhonchi. Thoracic and abdominal respiratory excursions were dissociated. The heart and abdomen were normal. The extremities showed no weakness, all reflexes were equal and active, and no sensory abnormalities were noted.

The hemoglobin content of the blood was 12.0 gm. per 100 cc. Leukocytes numbered 22,450 per cu. mm. and 86 per cent were polymorphonuclear cells. The urine was normal except for 1 plus albumin. The cerebrospinal fluid pressure was 130 mm. of mercury. The fluid contained 4 cells per cu. mm. (lymphocytes), and the protein and sugar content was normal. *Hemophilus influenzae*, type B, grew on cultures of blood and of material from the nasopharynx.

The patient was placed in a croupette with oxygen. Fluids were given intravenously and antibiotics (penicillin, streptomycin, chloromycetin, and sulfa drugs) parenterally. Respiratory distress increased greatly in the next hour and tracheotomy was performed. There was moderate immediate relief and by the next morning the patient was greatly improved. He became afebrile on the fourth day of hospitalization and was discharged on the eighth day.

### COMMENT

The present case is reported because of the infrequent occurrence of *H. influenzae* epiglottitis in this age group. Indirect laryngoscopy was required to visualize the epiglottis. The difficulty in respiration, phonation and deglutition in a febrile patient might lead erroneously to diagnosis of bulbar poliomyelitis.

120 North Painter Avenue.

## Acute Ulcerative Colitis Due to *Klebsiella*

### Report of a Case Following Penicillin Therapy

EDGAR ROSEN, M.D., Oakland

CONSIDERABLE INTEREST has recently been focused on the occurrence of acute enterocolitis following the use of antibiotics, particularly those of the broad spectrum group. No published reports, however, were found in which penicillin was the sole agent used before development of this syndrome.

The subject of this communication is a case in which penicillin therapy apparently led to acute ulcerative colitis and pure *Klebsiella* type 2 (B) grew on cultures of fecal matter.

#### CASE REPORT

A 47-year-old white man courthouse recorder was admitted to Peralta Hospital, Oakland, July 12, 1953, for a cerebral vascular accident. The past history included asymptomatic hypertension for ten years and excessive ingestion of alcohol.

Until the present hospitalization the patient had never received penicillin. There was no history of any gastrointestinal symptoms except for external hemorrhoids of about ten years' duration with occasional bleeding.

Examination revealed signs of typical left hemiplegia. The blood pressure was 180/110, the heart rate 112, the temperature 98° F., and respirations 24. The lungs contained occasional diffusely arising rhonchi in addition to numerous moist rales over the left lower lobe. Other positive physical findings included mild obesity, acne rosacea, reddening of the tongue, moderate emphysema, slight hepatomegaly and external hemorrhoids.

Results of laboratory studies, including blood cell count, urinalysis, Kahn test, cephalin flocculation, urea nitrogen content of the blood and spinal fluid examination, were within normal limits. Roentgenograms of the chest were normal except for tortuosity and elongation of the thoracic aorta. An electrocardiogram showed no abnormality other than occasional premature ventricular contractions. Intravenous pyelography showed a small parenchymal left renal calculus.

Treatment consisted basically of a 1,500 Calorie, low sodium diet with supplementary vitamins, and sedation with paraldehyde and phenobarbital. In addition, because of the physical signs of pneumonitis, 600,000 units of procaine penicillin daily was given intramuscularly for the first four hospital days. No other medications were employed.

The hospital course was smooth and the patient remained afebrile throughout his stay. The lungs became clear to physical examination in 24 hours, and there was gradual return of strength in the affected extremities. The blood pressure declined in several days to a normotensive level, and was never more than slightly elevated in subsequent determina-

tions. At the time of discharge on July 18, 1953, the patient's only complaint was that of residual weakness of the extremities on the left side.

**Second Admission:** Directly after returning home from the hospital, three days after completion of penicillin therapy, the patient began to have persistent diarrhea. This gradually increased in severity until six or seven foul-smelling watery stools, containing blood at times in small amounts, were being passed daily. The patient also complained of moderate lower abdominal cramping, and noted some diminution of appetite. No fever or chills were observed.

Following an unsuccessful trial of symptomatic treatment with a bismuth and paregoric mixture, sigmoidoscopy was carried out August 6, 1953. The mucosa was severely inflamed and edematous throughout with numerous confluent shallow ulcers and oozing of blood from many of these sites. Microscopic inspection of aspirated material showed very numerous erythrocytes, moderate numbers of leukocytes and occasional epithelial cells. No amebae were found.

The patient was rehospitalized for further investigation and treatment. The temperature was 98.6° F., the blood pressure 120/82, the pulse rate 100 and respirations 20. The tongue appeared dry and slightly coated. The abdomen was soft and not distended. There was mild tenderness to palpation in the left lower quadrant. The liver edge was no longer palpable. Considerable improvement was observed in the acne rosacea previously noted. Upon neurological examination, residual effects of left hemiplegia were noted. Other physical findings were unchanged from the previous entry.

Results of examination of the blood and urinalysis were within normal limits and agglutination tests for typhoid and paratyphoid were negative. No amebae or other parasites were identified in examinations of sigmoidoscopic aspirates and fresh stools, utilizing techniques including concentrates and stained smears. Cultures of fecal material on blood agar and various inhibitory media done on August 6 and August 8 produced pure growth of a non-motile short plump Gram-negative rod which was at first tentatively classified as *Aerobacter aerogenes*. It was finally identified, however, as *Klebsiella* type 2 (B).\*

A barium enema with double contrast technique showed many small shallow mucosal ulcers throughout the colon, most numerous in the rectum. The colon was normal in caliber and the wall appeared to be normally flexible throughout. A segment of the terminal ileum was filled and appeared normal.

Treatment was initiated on August 6, 1953, with sulfadiazine, which was discontinued three days later

\*Confirmation of the organism as *Klebsiella* (*Aerobacter*) was made by the Bacteriology Laboratory of the California State Department of Health. Dr. P. R. Edwards of the Communicable Disease Center, U.S.P.G.S., performed the serological identification. Information forwarded with the report<sup>1</sup> stressed the biological similarity and close serological relationship of the *Klebsiella* and *Aerobacter* groups. It was pointed out that until recent years the placement of an organism in either of these groups depended largely on the source of the original culture.



because of microscopic hematuria and crystalluria. Aureomycin was then given for the next five days, pending reports of sensitivity determinations. During these first eight days of therapy the patient continued to pass five or six watery stools daily. There was some symptomatic improvement, however, with subsidence of abdominal cramps and diminution of bowel urgency. The temperature remained normal except for slight elevations on two occasions.

When sensitivity studies were completed on the *Klebsiella* which was isolated, it was found that this organism was highly sensitive to terramycin, moderately sensitive to streptomycin and chloramphenicol, and resistant to penicillin, aureomycin and erythromycin.

The antibiotic therapy was accordingly changed to terramycin on August 14, 1953. During the next 72 hours the stools became partially formed and diminished in number to three daily. The patient then improved progressively to complete recovery.

Upon sigmoidoscopic examination on August 18, no ulcers were visible and the mucosa appeared normal except for slight granularity.

Additional stool cultures after treatment was begun produced a mixed flora with diminishing numbers of *Klebsiella*. A culture on August 10 showed a predominant growth of *Klebsiella*, moderate numbers of diphtheroids and a few colonies of beta-hemolytic *Staphylococcus albus*. A culture on August 17, after terramycin therapy, showed moderate growth of *Staphylococcus albus* with only a few colonies of *Klebsiella*.

All medications were stopped when the patient was discharged from the hospital on August 19, 1953. During the next four days the stools became fully formed and declined in number to one normal stool daily. No symptoms recurred during a follow-up observation period of six months.

#### DISCUSSION

Analysis of this case points strongly toward penicillin as the cause of the ulcerative colitis. This conclusion is favored by the absence of any previous intestinal disorder, by the onset of symptoms after penicillin therapy, by the pure cultures of a penicillin-resistant Gram-negative organism in the stools, and by the therapeutic response to an agent effective against this organism *in vitro*.

It has been well established that acute enterocolitis may result from the administration of other antibiotics,<sup>2, 3, 4, 6, 7</sup> notably aureomycin and terramycin, as well as chloramphenicol or a combination of penicillin and streptomycin. Bacteriologic studies of the stools in these cases have shown the frequent exclusive or predominant growth of resistant staphylococci. *Pseudomonas* and *proteus*<sup>4</sup> have also been found in similar circumstances, but *Klebsiella* has not been previously incriminated in this manner.

The fundamental pathogenetic factor in entero-

colitis of this type is generally acknowledged to be an alteration of the normal bowel flora. Sensitive bacteria are suppressed or eliminated, and rapid multiplication of certain resistant organisms takes place. Although these organisms are ordinarily innocuous within the intestinal tract in smaller numbers, under these conditions their prolific growth is at times associated with an inflammatory reaction in the wall of the bowel. This may be manifested by simple erythema and edema of the mucosa, but ulcerative lesions and pseudomembranous colitis have also been observed.

Diarrhea is the most common symptom of this disorder, although it does not invariably occur. Nausea, vomiting and anorexia are other complaints that may be encountered. Systemic symptoms are in some instances entirely absent or there may be various degrees of fever, toxemia, azotemia and circulatory collapse, leading at times to death.

Treatment of this condition is based upon the use of supportive therapy and appropriate antibacterial agents. Emphasis upon the frequent etiological role of staphylococci has led to therapeutic trials of erythromycin with favorable results.<sup>2, 5</sup> The case reported here, however, indicates the need to guide therapy by accurate identification of the offending organism and appraisal of its sensitivity.

#### SUMMARY

A case of acute ulcerative colitis secondary to penicillin therapy is presented. The causative organism appeared to be *Klebsiella* type 2 (B), which was present in pure growth on cultures of stools.

Cure followed the administration of terramycin, which was the most effective agent *in vitro*.

The subject of enterocolitis due to antibiotics is briefly discussed.

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## EDITORIAL

### Labor and Medicine

LABOR'S ILLS in the field of medical care were exposed to the view of the public and several hundred labor leaders in a San Francisco conference concluded March 21.

Called by Mr. George Johns, secretary of the San Francisco Labor Council, the conference spent two days in several panel meetings, exploring avenues for labor to follow in trying to get what it wants in medical care at the price it is prepared to pay.

At stake in this discussion is the pattern of medical care to be purchased by and supplied to members of labor unions in the San Francisco area—some 187,000 workers plus their dependents.

Aside from several decisions reached in terms of straight criticism of things as they are, the results of the conference asked for action on several points where the group felt it had not been adequately cared for in the past. Among other things, the conference reiterated its support of national compulsory health insurance as labor's ultimate goal. It also called for the establishment of labor health centers, to be staffed by physicians employed by labor. It demanded the elimination of "abuses" by physicians in caring for insurance-covered union members and discarded the suggestion that co-insurance, under which the individual would be asked to assume some financial responsibility for his own health care, be accepted as policy.

Behind this conference lies the history of Mr. Johns and his group in the past few years. This history started with the compilation of a "health survey" by Dr. Richard Weinerman, formerly associated with the School of Public Health of the University of California and later with the Kaiser organizations. This study sought to prove that the only way labor could achieve its goal of complete medical and

hospital care at the cost it was prepared to pay was to establish its own health centers and its own paid medical staff.

San Francisco physicians rebelled at this suggestion and pointed to its obvious scientific defects, especially its potential proclivity toward reduced standards of scientific medical care. In the face of this opposition, the San Francisco Labor Council has not taken any publicly announced steps to implement the medical center idea.

Now, after months of inactivity, the two-day conference reverts to the medical center plan as the solution to labor's medical care problem, simultaneously admitting that this is simply a stop-gap until national socialized medicine can be secured.

The conference also found that the Kaiser plan of closed panel medical practice in selected hospitals is the "most attractive one" available to organized labor today. This type of practice has been termed by many physicians as one which makes "captive patients" of its members and "captive doctors" of its employed physicians. Medicine as a whole has urged the retention of the free choice principle for physicians and hospitals as the system most likely to provide good medical and hospital care.

When the House of Delegates of the California Medical Association meets next month, the lessons of this labor conference will doubtless come in for considerable discussion. The suggestions of the Medical Services Commission will be before the delegates for consideration and it is likely that still other suggestions will be forthcoming.

Medicine is being called upon to provide a service at a price. Whether or not the price is right remains to be seen. Whether or not medicine can go far enough to meet the present demands, at the price offered, is still a moot question.

The only conclusion obvious at this writing is that a great deal of education will be required in the months to come. Physicians and labor alike will need education in the various phases of medical economics involved in this complex problem. Physicians must meet the ever-present public demand for the provision of good medical care at a rate the public can and will pay. Labor must meet its obligations to the public, to employers and to physicians in recognizing the economic limits beyond which good medical care cannot go. Possibly the familiar pattern of collective bargaining tactics will again emerge, where labor asks for more than it expects to get and settles for less than the maximum demand.

Members of the House of Delegates will have a chance to ponder these considerations, among others, at the forthcoming meeting. The amount of thought given to this problem between now and the meeting date may well have an important bearing on the decisions subject to distillation by the House of Delegates. The end product is most important.

## New Health Director

GOVERNOR GOODWIN J. KNIGHT'S APPOINTMENT of Dr. Malcolm H. Merrill as State Director of Public Health brings to this important post a man with a wealth of experience, a wide knowledge in his field and a splendid relationship with local health officers, medical societies, health organizations and all those interested in maintaining the highest possible public health standards. The California Medical Association recommended this appointment to the Governor and is pleased to see the recommendation followed. Dr. Merrill succeeds Dr. Wilton Halverson, who resigned not long ago after a number of years of outstanding service in the position to accept a full-time post with the University of California at Los Angeles.

The Council of the Association has already assured both the Governor and Dr. Merrill of its complete cooperation in all vital matters of public health. Congratulations are due both these men on the appointment now made. The beneficiaries will be the people of the state of California.

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## LETTERS to the Editor . . .

### Can Panels Survive?

THE OPERATION of group plans for rendering medical care preceded the use of prepayment plans by many years, but the development of prepayment plans combined with the group-closed panel system has been comparatively recent. More significant is the impetus for expansion given the group principle by the use of the prepayment technique. It is understandable that business men have been attracted to the organization of closed panel medicine because it lends itself to patterns of commercialization and to objectives with which they are familiar.

The service type of prepayment medical care plans which render care through cooperative organizations of M.D.'s do not have the actuarial experience to be so precise in their costs as other types of insurance. This is so because the doctor alone is responsible for the kind and type of medical care the patient receives and no third party tries to direct it. It does, however, get the doctor the patient wants for himself, and makes use of the principle of prepayment.

The indemnity type of plan has a sound insurance principle so far as the underwriter is concerned: so

many dollars will be paid for a listed procedure. If the amount of the indemnity does not cover the cost of the service to the patient, the patient must pay the difference. This defect is eliminated when there exists a contract with those rendering the care to adhere strictly to the schedule. When such an agreement exists, it usually results in the setting up of a closed panel of physicians who are then competing with their confreres on the basis of being on the panel and the price of service alone. This limits the choice of physician by the patient as well as the choice of the patient by the physician.

The closed-panel, utilizing the prepayment plan, offers to sell medical care to the public for a stated premium, the services to be rendered by members of the panel. These panels are usually made up of doctors who are giving attention to cases within their specialty. The free choice of physician by the patient is necessarily limited and the device tends toward the creation of a monopoly. What is the effect of the three different plans on the quality of medical care? This is a difficult matter to assay accurately. It is doubtless possible for good care to be given in any of these plans, where only the medical needs of

the patient are considered, but if costs and profits are given priority the quality of medical care is impaired and the welfare of the patient suffers.

It is on the business side where the three plans really contrast. The service plan agrees to render unqualified and total professional service for all conditions covered in the contract and the doctor agrees to render full service. Here there are no additional costs except in the cases where there is an income limitation on the contract, in which case it functions as an indemnity. In that case, prior financial arrangements need to be made between the patient and the physician.

The indemnity plan requires the payment of a specified number of dollars for a specified procedure on the indemnity schedule. If the procedure is not listed the insurance company names the amount of indemnity. Real comprehensive schedules are seldom listed on the policies. The patient usually believes that the listed indemnity covers all his costs whereas it seldom does. Therefore, the physician needs to discuss the costs in advance of rendering service. It must be done in a frank and fair manner, but this business procedure seems too often avoided by the doctor and is left to some employee in his office. This employee frequently has not had any business experience or training and certainly no medical training, yet she often determines the fee and presents it to the patient. So this third party comes into the picture and strikes the patient in his most vital spot!

The closed panel has a financial system, usually directed by a business manager with training and experience in the field of business administration. The employees of this department are trained in methods for the presentation of bills and also in their collection. The interview with the patient on money matters is approached skillfully and followed through. Where there are additional charges, these are frankly explained and diplomatically and promptly collected. It is possible through the control of medical procedures to greatly influence the cost of the service to the patient. The budgeting of the cost of professional care is also possible because the doctors are usually paid a monthly salary like any other employee. Some of the plans are so skillfully

set up legally that they are termed non-profit foundations, etc.

The phenomenal growth of voluntary health insurance plans is a good indication of public acceptance of the principle of prepayment. All of the plans have some desirable features. If doctors are willing to accept indemnities paid by insurance companies this year, will they be willing to accept them next year when they may be lowered by the insurance companies? Closed panels with their fixed and controlled costs can make premiums cheaper. Unions and others are often not able to weigh the intangible assets, but look only at the premiums of other plans. Too, closed panels often employ public relations experts, use direct advertising and inspire free publicity which stimulate interest in their plan. Can one deny that their business methods are productive of business and profits?

Suppose every one of us accepted and promoted the good principles of prepayment then seriously recommended them to every patient that came into our offices. Then if we honestly, by word and deed, sold our patients on the worth of our service and the worth of all good medical service, both the patient and the doctor would be better satisfied. The third step: To ourselves take over the business side of medicine in our own offices—to learn how and when to talk fees and to do it before major expenses are incurred. This will meet with the hearty approval of our patients and will reflect the confidence we have in the value of our own services. It will offer the patient a deserved opportunity to discuss a matter that concerns him. Finally, if we as doctors wish to have control over the practice of medicine, we can only have it through our own organization. Therefore, we need to recommend our own plan to our patients and sell them on the value of membership in it. We should frankly tell them we are pleased with their foresight and render to them better medical care than they can get anywhere else regardless of price.

Can panels survive? You will answer that question by your own service.

J. FRANK DOUGHTY, M.D.

231 West Eleventh Street  
Tracy, California



# California MEDICAL ASSOCIATION

## NOTICES & REPORTS

### The Treatment of Cancer by John E. Gregory, M.D.

A Report by the Cancer Commission of the California Medical Association

FOR OVER FOUR YEARS the Cancer Commission has been receiving reports of the activities of John E. Gregory, M.D., of Pasadena in the treatment of cancer by a method of his own development. Most of the reports have been in the nature of complaints, some from members of the medical profession and others from non-medical persons. Included in the latter are two science editors of metropolitan newspapers, both of whom reported that they had been subjected to considerable pressure by Dr. Gregory's family and friends. This pressure was directed toward securing favorable publicity in the newspapers concerned for Dr. Gregory's methods.

In January 1953 two of the members of the Cancer Commission, its chairman and John W. Cline, M.D., visited Dr. Gregory in an attempt to secure Gregory's cooperation in releasing some of his material for impartial trial by a competent group of physicians at any reputable institution of Dr. Gregory's choosing in California. No such cooperation could be secured, and in view of the claims being made by Gregory, and because of the very considerable number of cancer patients being attracted by those claims, the Commission undertook an investigation of the Gregory method of treatment.

The investigation has been conducted under considerable difficulty because of Gregory's refusal to provide any assistance whatever, not only through his refusal to supply any of the material under any conditions whatever, but also in other respects which will be apparent in the body of this report.

#### 1. Nature of Treatment Method

Dr. Gregory's theories and their application in his treatment of cancer can best be summarized from a monograph which he has published. This volume is entitled "Pathogenesis of Cancer and Applied Ther-

apy" and was published by Bruce Humphries, Inc., of Boston in 1952. On pages 172 and 173 of this text appears the penultimate chapter entitled "Summary." This synoptic chapter presents the following theoretical approach.

Since some animal cancers have been proved to be due to a virus it is therefore possible to produce cancer with a virus.

The milk factor not only produces cancer of the breast in mice but also "cancer of any tissue in the mouse, depending either on abnormal hormonal physiology or on the location of irritants."

Mouse cancer is identical to human cancer.

A virus has been found in over one thousand human cancer tissues tested, but not in benign tumors. The virus has been cultured and injected into animals producing various types of cancer.

The virus produces specific antibodies in animals, a complement fixation test in human serum is "88% diagnostic for cancer."

An antibiotic has been developed for the cancer virus,

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and its action can be demonstrated in the electron microscope.

The amount of virus present is in direct proportion to the grade of malignancy.

Although Gregory has employed several different agents in cancer during the past few years, his latest, which is also the material which the Commission was finally able to secure for testing, he designates as Gregomycin. The final chapter of the monograph states that Gregory isolated Gregomycin at his home, and he informed representatives of the Commission that the antibiotic was isolated from the soil on his estate in San Marino. Gregory further states in his text that Gregomycin destroys both Gram-negative and Gram-positive organisms and "apparently destroys the cancer virus." He further states that his work suggests that Gregomycin should be tried on acute virus infections.

Several other facets of the Gregory concept of the cause and control of cancer are developed in his monograph. Steroid hormones are used to a considerable extent and Gregory illustrates the theoretical association of hormone treatment with the theory of the virus cause of cancer in the following example:

"A case of cancer of the breast, Grade IV, was treated with testosterone, and after one month became Grade III; after another month it became Grade II. The concentration of virus in the Grade IV cancer was high, in Grade III it was diminished, and in Grade II was markedly diminished. This shows that the same pituitary hormone which stimulates the malignant cell to grow stimulates the virus to grow also."

A supplementary measure in Gregory's management of cancer is in dietary restriction. The groundwork for his ideas on diet in the management of cancer is again to be found in his free association of the disease in animals and humans. On page 143 he states that "there is no doubt that cancer in animals is the same disease as in humans." This remarkable statement is followed by a claim of having developed cancer in animals by feeding them cancer tissue. From these claims are developed the following recommendations:

1. Public health departments should start an inspection service to locate and discard cancerous tissues from human consumption.

2. The milk factor having been proved to be a causative factor of breast cancer in mice, pasteurization of milk should be of value in preventing the spread of cancer to humans and steps should be taken to make appropriate cancer tests in cows.

3. Gregory states that he has found up to 70 per cent eggs containing the cancer virus but never in eggs from hens fed only on greens and grain.

4. Even with pasteurization of milk and thor-

ough cooking of eggs and meat some patients with cancer may still be highly allergic to the "vaccine" remaining in the food.

5. Some patients with leukemia can be maintained in excellent health on a meat-free diet, but will undergo a serious acute exacerbation after ingestion of meat.

6. Some transfusions may be harmful to patients with leukemia because of the cancer virus in the donor's blood.

7. B-complex vitamins will improve the action of the liver and cause it to destroy steroid hormones, thus cutting down the excess stimulation to certain cancers.

8. Cancer patients should be kept on a diet free of meat and fat and a high fruit diet is of value.

Gregory also advocates the use of conventional methods of treatment where the disease is in an early stage. The introduction to "Pathogenesis of Cancer" says that "cancer research has reached another milestone and perhaps it is worth while to bring everyone up to date on the results of this research." This is followed by a statement that the book in no way suggests that "we can neglect essential and early surgery or radiation in treating cancer."

## 2. Proponents

The only person known to the Commission as concerned in the use of "Gregomycin" is its originator, John E. Gregory, M.D., and certain employed medical assistants he has had for varying periods of time. Although Dr. Gregory reported in a telephone conversation several months ago that his antibiotic agent was being used in a testing program in an "eastern medical center," he refused to divulge any further information.

Dr. Gregory owns his office building, completely occupied by him, at 45 South Mentor Avenue, Pasadena. On December 5, 1944, Articles of Incorporation No. 78581 were filed for the Pasadena Research Laboratories with directors listed as John E. Gregory, Evelyn L. Gregory and Russell Bavouset. This company has no discoverable interest in research and it manufactures and distributes pharmaceuticals, chiefly vitamin and hormone products. The organization was set up on February 10, 1942, by J. E. Gregory who stated that he and Harry Stotesbury were partners. On March 4, 1942, suit was filed by Harry C. Stotesbury against Gregory in the Pasadena Civil Court, Stotesbury asking \$10,000 damages from the dissolution of this partnership. The case was settled out of court. On July 28, 1943, an item of record shows that John E. Gregory executed a bill of sale for the Pasadena Research Laboratories to Lydia Meleen for the sum of \$10. A photostatic copy of another bill of sale dated August 19, 1943, shows that

the Pasadena Research Laboratories was reconveyed to John E. Gregory, M.D., by Lydia Meleen for the sum of \$10. As of April 21, 1953, the financial report of the Pasadena Research Laboratories showed total assets of \$185,197.

Early in 1948 in the District Court of the United States for the Southern District of California, Central Division, Pasadena Research Laboratories Inc., a corporation, and Russell R. Bavouset were found guilty on five counts of violations of the Federal Food, Drug and Cosmetic Act in that they "did unlawfully cause to be introduced into interstate commerce" adulterated and misbranded drugs. The corporate defendant was fined \$3,000, and Bavouset was placed on five years' probation. The decision was appealed to the United States Circuit Court of Appeals for the Ninth Circuit and on July 16, 1948, No. 11690, the judgment of the lower court was affirmed (169 Fed., 2d., 375).

Dr. Gregory's monograph, "Pathogenesis of Cancer," carries a statement that the research therein reported was done by Gregory working through the Fremont Foundation, a non-profit corporation for medical research, and the biography on the jacket of the book states that the Foundation was started in 1947. A careful search at the office of the County Clerk in Los Angeles, including search of the records in the "fictitious names" section, and also in corporations, showed nothing pertaining to the Fremont Foundation. The Library of the Health Department of the City of Pasadena also had no information on this Foundation.

A sketch of the author on the jacket of Gregory's book also states that "he has been on the attending staff of the Los Angeles County Hospital and White Memorial Clinic for several years as assistant professor of medicine at the College of Medical Evangelists." The fact is that Gregory has been off the staff of both institutions for some years, and inactive at both since about 1939. Although he has held other hospital appointments in the past, at the time of the Commission's investigation Gregory had hospital privileges only at the Alta Vista Hospital in Altadena and the Behrens Memorial Hospital in Glendale.

### 3. Experimental Evidence Offered

The experimental evidence offered by Gregory is best reviewed in his monograph "Pathogenesis of Cancer," Chapter II, entitled "Electron Microscopy of Human Cancer Virus." The method employed is described as follows: "Human malignant tissue is taken directly from surgery, and with absolutely sterile technic, ground up completely with mortar and pestle, diluted with triple distilled water, and filtered through a Berkfeldt filter. The filtrate was then examined in the electron microscope. Over 1,000 malignant tissues and the same number of

normal tissues or benign tumors were examined in this way." Gregory states that spherical virus-like bodies 0.1 microns in diameter were found in 100 per cent of the malignant tissue but never in the benign tumors or normal tissue. He states that these objects have cell detail including cell wall, nucleus and cytoplasm. They do not disappear when left under the electron beam for as long as one hour. Many electron micrographs reproduced in the monograph purport to show the identical cancer virus in malignant neoplasms in the mouse, human breast, leukemia, hypernephroma, colon, stomach and other sites. Gregory's original agent was an inactivated filtrate of cultures of *Bacillus subtilis* Tracy, following his observation of the phagocytic action of this bacillus on the alleged cancer virus. Apparently since his discovery of Gregomycin this earlier agent has been abandoned.

Gregory published two articles in the *Southern Medical Journal*, "Virus as a Cause of Human and Animal Malignancies," February 1950, and "*Bacillus subtilis* as an Antibiotic in the Treatment of Cancer," May 1950. Through the influence of the editor of the *Southern Medical Journal*, who also wrote a laudatory editorial on the occasion of the publication of Gregory's monograph, Gregory had an exhibit at the annual meeting of the Southern Medical Association on two occasions, in 1948 and 1952.

Gregory also claims to have reproduced cancer in animals by injection of cultures of the virus which he has so regularly identified in human cancer.

### 4. Clinical Evidence Offered

On the occasion of the visit of the Commission's representatives with Dr. Gregory in January 1953 he described a series of 14 patients whose histories are included in his monograph, and some of which will be described below.

On that occasion he also brought five patients into the room, and these patients were seen under the following handicaps: No facilities for adequate examination were provided and only a brief "spot" examination was possible; no written records were offered, Dr. Gregory reciting the details of each patient's history from memory; no microscopic sections or radiographic studies were available for review. These five patients were as follows:

1. A woman who had had radical mastectomy for an extensive carcinoma of the breast had developed recurrent local disease one year prior to this occasion, for which x-ray therapy had been given. She then developed nodes in the supraclavicular space and some new recurrences on the chest wall and Dr. Gregory stated that his treatment had kept the disease under control for eight months. Local examination showed small nodules of apparent recurrent disease on the chest wall at the site of the radical mastectomy. There were small hard supraclavicular

nodes up to 1.5 cm. in diameter characteristic of metastases.

2. An 8-year-old girl who had been treated by thyroidectomy, x-ray treatment and radioactive iodine for a papillary carcinoma of the thyroid. She then came under Dr. Gregory's care and at the above time had residual tumor in the right submandibular area.

3. A woman with recurrent carcinoma of the breast involving the chest wall and axilla following surgical treatment and irradiation, under treatment for some months by Gregory; examination showed a small area of residual local carcinoma.

4. Another woman with carcinoma of the breast and local recurrence and lymphedema of the homolateral arm following mastectomy, in whom Gregory believed that his treatment has maintained control of the local recurrence since the summer of 1952 (six months or less).

5. A woman with bilateral breast carcinoma, originally treated surgically by bilateral radical mastectomy, who developed a recurrent left axillary mass which was enlarging and since the use of Gregory's agent this area of disease has regressed to a fairly small but obvious residual focus of carcinoma.

In Chapter VI of the Gregory monograph case histories of 16 patients are presented, presumably offering the best evidence for the effectiveness of his treatment that Gregory could muster. The longest period of survival in any of these cases after the onset of Gregory's treatment is two years. In one patient treatment had only been under way for five months and in still another treatment was *just starting*. With one exception all of these patients had previous treatment by conventional methods in their immediate past. In addition, the behavior of the disease in some of them was simply a manifestation of the expected natural history of the process. In many instances it was impossible to determine whether survival and apparent control of the disease was due to treatment or to natural causes. Reasonable examples of these factors are as follows:

CASE 2. (Page 80 of monograph): Mrs. M. L. treated in 1946 by x-ray and radium therapy for carcinoma of the cervix. In June 1947 exploration was done and an apparently inoperable 5 cm. metastasis in the broad ligament and pelvic wall was discovered. She was seen by Dr. Gregory in February 1948 with what he describes as a large cancer of the cervix involving the bladder and rectum and extending up into the abdomen where there was a palpable tumor 8 inches long and 6 inches in diameter. The patient had both vesicovaginal and rectovaginal fistulae. Dr. Gregory started treatment with daily injections of testosterone along with daily injections of his antibiotic. Three months later she was up and around and at the time of reporting she had been well for 24 months. The photomicrograph is apparently taken from the original biopsy in 1946.

Two obvious possibilities tend to make this case invalid. One is the fact that occasionally women following heavy irradiation for pelvic carcinoma develop a very impressive productive radiation reaction of the soft tissues of the pelvis which can exactly mimic very extensive recurrent carcinoma. Second, carcinoma of the cervix forming so bulky an abdominal mass is so rare as to be a museum item, for the disease almost invariably causes death by ureteral obstruction, uremia and sepsis long before the tumor attains any such size. The combination of the antibiotic with testosterone is further invalidation of this case, and, failing microscopic evidence to the contrary, the bulky abdominal mass may have been an ovarian neoplasm which proved responsive to testosterone.

CASE 7 (Page 94 of monograph): Mrs. D. O., aged 56, had a uterine sarcoma for which repeated operation had been done and at the last procedure "the surgeons were of the opinion" that they did not get the entire tumor. Three months later she was seen by Dr. Gregory with a 35-pound loss of weight, severe jaundice and an enlarged nodular liver extending below the umbilicus. Three months after beginning treatment with Dr. Gregory the jaundice and ascites had entirely disappeared and the enlarged liver had returned "so much to normal that it was impossible to feel the liver edge."

This case history again suffers from lack of microscopic proof of involvement of the liver by cancer, particularly as the pattern of spread of uterine sarcoma is almost invariably to the lungs rather than to the liver. The possibility of hepatitis producing hepatomegaly and jaundice with eventual recovery with supportive treatment is too strong to be denied.

CASES 14 and 15 (Pages 112 and 117) are the histories of women in whom both operative and x-ray therapy were given for carcinoma of the ovary. The antibiotic is given credit for their "recovery," the first woman for a period of six months when she died of a cerebral hemorrhage, and the second for a period of one year, despite the fact that the combination of prior treatment and the natural history of the disease frequently produce temporary control of the disease.

CASE 1 (Page 79) presents the only apparent undiluted effect of the antibiotic. The patient was a man 55 years old with multiple myeloma. Assuming that no prior treatment was given the patient has remained well for 24 months after the institution of "antibiotic" treatments. This one case, however, may be only illustrative of the fact that multiple myeloma also is occasionally known to undergo periods of spontaneous remission.

In Chapter 15, a summary of "all other cases treated" is offered, and the introduction to this chapter states that in the following cases that will be



mentioned the patients either had surgical or x-ray treatments along with the antibiotic, or had been treated less than one year. The fallacy of crediting any new agent for whatever control such patients may have will be obvious to any experienced clinician. This chapter concludes with a statement that four groups illustrate different aspects of cancer treatment with the antibiotic. (1) Patients treated by conventional means and the antibiotic, in which it is admitted that operation and radiation may have produced the cure. (2) A group receiving antibiotic for recurrent tumors, improved for about three months, then becoming worse and dying of their disease. It is stated that these patients "probably developed strains of virus resistant to the antibiotic." (3) The third group is one in which the patients "did fairly well" but died of other causes. (4) A fourth group represents those "in which the disease was so far advanced that they died shortly after initiation of treatment."

Each of these groups is said to number about 20 or a total of 80 patients. At the time of the interview with Dr. Gregory in January 1953 he stated that he had treated a total of about 100 cases of cancer and that "20 per cent have cleared up."

#### 5. Autopsy Data Offered

None.

#### 6. Experimental Evidence Developed by the Cancer Commission and Independent Investigators

After repeated refusals by Dr. Gregory to supply the Commission with any of his agent for testing of any sort, it was finally possible to secure an adequate amount of the Gregory preparation from certain patients to whom he had given the material for administration at home. In each instance the material was adequately identified as to its origin, either by Gregory's name, or the designation, "Gregomycin," appearing on the label of each vial used for testing purposes.

The following report was received from H. E. Pearson, M.D., Professor of Public Health, University of Southern California School of Medicine and Chief Medical Microbiologist for the Los Angeles County General Hospital.

"Culture of this fluid on blood agar plates and in thioglycollate broth yielded no growth. Antibacterial activity was assayed in tryptose broth. In a final dilution of 1:10 the material showed no inhibition of growth of organisms after 24 hours' incubation at 37°C. The organisms used were as follows: *Micrococcus pyogenes* var *aureus*, *Streptococcus pyogenes*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *B. subtilis*.

"Antiviral activity of the fluid was tested against the PR8 strain of influenza Type A virus. Albino mice weighing 20 to 30 grams each were used.

Groups of 10 mice were inoculated intranasally each with .05 cc. of  $10^{-5}$  and  $10^{-6}$  dilutions of egg passaged virus. Of the mice which received the  $10^{-5}$  dilution the test group of 10 mice was inoculated intraperitoneally each with 0.3 ml. of 'Gregomycin.' The control group of 10 mice received saline intraperitoneally. Intraperitoneal injections were given repeatedly 12, 24, 48, 72, 96 and 144 hours after the virus injection. All surviving mice were killed on the tenth day following viral injection and the lungs examined to determine the percentage of lung involvement which might be attributed to viral infection. Results were as follows:

	Percentage of Involvement:					No. of Survivors				
	0	25	50	75	100	0	25	50	75	100
Gregomycin (One dead 7th day—50% lung involved) .....	....	1	3	5	....					
Saline (One dead 9th day—100% lung involved) .....	2	3	1	2	1					
Virus Control—Received $10^{-6}$ virus intranasally. No intraperitoneal injection .....	6	4	....	....	....					

"The above data indicate that Gregomycin did not alter the course of influenza infection in mice following a minimal infective dose of the virus."

For purposes of testing the preparation against animal neoplasms of known sensitivity to other agents, a supply of Gregomycin was submitted to Nathan B. Friedman, M.D., Director of the Division of Laboratories, Cedars of Lebanon Hospital, Los Angeles, a pathologist with wide experience in experimental neoplasms and their response to many different agents. Dr. Friedman's report is as follows:

"A mice bearing C1300 neuroblastoma and C<sub>3</sub>H mice bearing an epidermoid carcinoma were treated with courses of therapy up to 18 doses. The treatment was daily except for one day's rest over weekends. The daily dose was 400 roentgens of radiation, 0.5 milligrams per kilogram of nitrogen mustard and .075 cc. of the test solution (Gregomycin).

"Other animals were treated by direct injection of tumor masses with 2 mg. per kg. of nitrogen mustard, 1 mg. per kg. of TEM, 2 mg. per kg. of aminopterin, 0.25 cc. of colloidal chromic phosphate (0.5 mc.), 0.1 cc. of physiological saline and 0.1 cc. of test solution.

"Tissues were examined histologically at appropriate intervals.

"The characteristic reaction to radiation and the similar effects of the other known therapeutic agents were evident in the tumors. There were no differences between the tumors treated with the test solution and the controls.

"Certain known effects on the intestinal mucosa of the chemotherapeutic agents employed were also noted in the treated tumor-bearing animals. No such effect was noted in the animals treated with the test solution."

Further samples of Gregomycin were submitted to John B. Field, Associate Professor of Medicine, University of Southern California School of Medi-

cine, who is in charge of a project for the testing of agents of possible chemotherapeutic value, particularly against strains of leukemia in animals. The report of Dr. Field is particularly pertinent because of the several cases of leukemia which Gregory quotes as having benefited from his antibiotic.

"The material was tested against acute lymphatic leukemia L4946 transplanted into mice of the Ak strain. The results of the test are as follows:

	Survival	
	Average	Range
Controls .....	13 days	12-14 days
Test group.....	13 days	8-16 days
Positive controls.....	18 days	16-20 days
(Amethopterin, 1.5 mg. per kilo)		

"The Gregory material was given 0.5 cc. per day intraperitoneally which calculates to a relatively large dose when compared with human dosage. The test material as well as Amethopterin were given in the usual fashion beginning 48 hours before implants of the leukemia and injected daily in the stated dosage.

"It can be concluded that the test material had no influence on the survival of Ak mice with an acute leukemia, whereas in very small doses Amethopterin significantly prolonged the lives of the leukemic mice. Furthermore, every mouse in the test group succumbed with frank and general evidence of leukemia."

#### 7. Clinical Evidence Developed by the Cancer Commission

Other than the five patients seen at Dr. Gregory's home and described under section four above, there seemed to be no possibility of the Commission's developing any clinical evidence of its own as the supply of the agent procured was adequate only for the laboratory testing reported above. As an indirect approach, however, all the death certificates signed by Dr. Gregory or his assistant were reviewed at the Pasadena Department of Health for the years 1947 to 1952, and for the years 1948 to 1952 in the cities of Los Angeles and Glendale. Those certificates listing cancer as the cause of death totalled 82, and were distributed by anatomical primary sites or by system as follows:

16 leukemia (lymphatic, acute and chronic)	2 multiple myeloma
7 colon	2 lymphosarcoma
2 gallbladder	1 parotid
3 skin	4 ovary
3 pancreas	3 malignant melanoma
3 lung	1 prostate
5 stomach	3 carcinomatosis
14 breast	1 testicle
2 rectum	1 esophagus
3 cervix	1 salpinx
3 uterus	1 cecum
	1 sarcoma humerus

More recently, a few of the patients treated by Dr. Gregory at a local hospital have been reviewed by a special committee of the medical staff appointed for that purpose. The Commission gratefully acknowl-

edges the cooperation of this hospital committee, the conclusions of which are as follows:

"Dr. Gregory invited the Committee to his office. ... At that time he brought in seven patients who, according to him, had been greatly benefited by the use of Gregomycin. There were 3 carcinoma of the breast, 1 carcinoma of the ovary, 1 carcinoma of the peritoneum (primary undetermined), 1 papillary carcinoma of the thyroid, 1 melanoma. All of these patients were treated by conventional methods of therapy. All of these patients were examined carefully by at least two members of the Committee ... laboratory and operative reports were verified in most cases and pathological report or slides were available for review.

"It was the opinion of the Committee that the clinical course of all seven cases probably was uninfluenced by the use of Gregocin or Gregomycin, as it was our opinion that we have all seen many cases similar to these ... without any antibiotic or cancer drug being used.

"We went over the case records of 25 death cases from the files of the hospital during the year of 1953. All were operative failures or inoperable cancer ... all received Gregocin for weeks or months in the hospital ... many were previously treated for many months at (Gregory's) office but this data, of course, we have not been able to obtain, since he will not cooperate. It was our opinion that none were benefited by Gregocin or Gregomycin. The clinical courses were exactly as would be expected by the use of conventional treatment methods.

"It is our opinion that Gregocin or Gregomycin has been shown to have no clinical benefit in the treatment of cancer. Dr. Gregory has not complied with the request of the staff to give us a supply of Gregomycin for experimental trial in animals. No inoperable cases were presented to the Committee to study the effects of Gregomycin or Gregocin alone.

"Recommendations to the Executive Committee:

"1. Patients in the hospital or next of kin should be required to sign consent forms before any experimental drug be used for cancer.

"2. It is the opinion of the Committee that Dr. Gregory has been given ample opportunity to prove the merit of his drug for cancer patients in the hospital. Inasmuch as we have seen no cases benefited by the use of his drug, we recommend that it no longer be used in the hospital."

[The full report of this Committee, and its detailed account of the cases reviewed, are in the files of the Cancer Commission.]

Mr. C. H. G. visited the office of the secretary of the Cancer Commission on August 13, 1953, stating that he had been taking treatments from Dr. Gregory for almost four years for "colitis." About June 1953, he said, Dr. Gregory examined him and found a suspicious area in the rectosigmoid. The patient reported that Dr. Gregory told him that if he would go regularly for treatment Dr. Gregory would pre-

vent or cure a cancer. The patient was advised by the Commission secretary to go immediately to a reputable physician in his home city of Oakland for further examination and for appropriate operation if a neoplasm was found. A few days later the patient saw Dr. Gregory again and the latter tried to rush him into a hospital. The patient refused and returned to Oakland where on August 20, 1953, a carcinoma of the sigmoid was removed. Following operation he attempted to secure some of the medicine from Dr. Gregory. Dr. Gregory said that the treatment was still available only to patients who are under treatment in his office, since it is still an experimental treatment. Dr. Gregory stated that he could send the medicine if the patient wished and then he could be examined by Gregory from time to time. The patient secured two 30-cc. vials of the medicine from Dr. Gregory for the sum of \$21.09. The patient stated that Dr. Gregory had made numerous claims such as that the A.M.A. had visited him and approved his work, and that if the patient would come to see him every four months he would never have cancer.

A Ukiah physician informed the Commission on June 24, 1953, that a patient with squamous cell carcinoma of the cervix was being treated by Dr. Gregory with Gregomycin with no apparent improvement.

The Commission has a signed and witnessed statement from the husband of a woman suffering from multiple myeloma who was assured by Dr. Gregory that he could definitely control her pain if he would dismiss any other physicians from the case. Dr. Gregory accepted the word of the husband as to the diagnosis, and to the best of the husband's knowledge Dr. Gregory at no time reviewed any of the evidence in the form of x-ray studies, laboratory evidence or biopsy. The patient was given injections by Dr. Gregory at her home every night for over two months and at the end of six months the patient was improved and Dr. Gregory stated that he was going to cure the patient. Later he told the husband some six or eight times that the patient was undoubtedly going to get well. At the six-month interval she was allowed to get up and walk and developed very severe pain in her leg which was due to a pathological fracture. Dr. Gregory removed her to a hospital and put her in traction, still insisting that she was going to recover completely. Eventually the pain became extremely severe and as many as six or seven injections a day were given but only emperin and codein were given for her pain. The labels on the vials from which the injections were given were usually removed but on one bottle the husband saw the name "Gregomycin" and several others in which the designation all started with "Greg." Dr. Gregory charged \$15 per week for the first 18 months of care but during the terminal period before he was finally

discharged from the case he sent a statement for a fee of \$475 for two months. The husband tried to contact Dr. Gregory concerning a reduction of his statement but Dr. Gregory refused to talk to him.

#### 9. Autopsy Data Reviewed by the Commission

It has only been possible to obtain paraffin blocks of tissue from two autopsies on patients treated with Gregomycin until a week or less before death. Review of sections of these blocks by three pathologists, John W. Budd, M.D., Louisa E. Keasbey, M.D., and James E. Kahler, M.D., indicated no satisfactory evidence of any chemotherapeutic effect on the neoplasm.

#### 10. Consultant and Other Reports

Opinion concerning Dr. Gregory has been limited to an investigation of certain statements which he has made to representatives of the Cancer Commission. Only three of these will be recited.

Following the urgent request of January 1953 that he designate some institution in California for a trial of his agent, Dr. Gregory said that he would approach the president of the College of Medical Evangelists concerning the possibility of such trial. During the following months the president of that school informed the Commission on two occasions that he had not been approached by Dr. Gregory. On July 8, 1953, the chairman of the Commission wrote to Dr. Gregory reminding him of his proposal. Under date of July 27, 1953, Dr. Gregory stated in a letter to the chairman of the Commission that he had had difficulty in contacting the president of the College of Medical Evangelists, but he was able to "contact Loma Linda," and that "they have not been able to have time to review the work." An inquiry was then addressed to the president of the College of Medical Evangelists and on August 9, 1953, he replied that investigation had been made and no evidence found to indicate that Dr. Gregory had made any approach, formal or informal, to any of the administrators or responsible faculty members, either in Los Angeles or at the Loma Linda campus.

Dr. Gregory also informed a representative of the Cancer Commission that in the year 1950, when he was en route home from the International Cancer Conference in Paris, he had been invited to go to Bethesda, Maryland, to address a group of the staff of the National Cancer Institute. Dr. Gregory stated that the Institute was able to arrange a meeting of many of its staff members on a Saturday evening especially for Dr. Gregory's convenience, that he presented his theories and his experimental and clinical work in some detail and that his presentation was received with very considerable enthusiasm. This extraordinary account was investigated by addressing a letter to J. R. Heller, M.D., Director of the National Cancer Institute, who replied on Novem-

ber 3, 1953, that he had ascertained the situation concerning Dr. Gregory's visit to the National Cancer Institute and the facts were as follows: Dr. Gregory stopped at the Institute on his way home from Paris and saw only Mr. Vernon Riley, a member of the staff of the laboratory of biochemistry. Mr. Riley told Dr. Heller that he talked for about 20 minutes with Dr. Gregory, answered questions courteously and furnished Dr. Gregory some reprints. Dr. Heller was not able to find knowledge of any meeting or gathering to which Dr. Gregory was invited nor was he able to uncover any responsible person other than Mr. Riley with whom Dr. Gregory talked. Dr. Heller further stated that so far as he knew no member of the Institute had endorsed Dr. Gregory's theories or findings relative to the presence of viral bodies in human cancers.

Still another example involved a noted scientist in cancer research, John J. Bittner, Division of Cancer Biology, University of Minnesota. One of Dr. Bittner's achievements has been the identification of one of the primary causes of breast cancer in mice, an agent transmitted through the maternal milk which has the properties of an infectious agent or virus. During the interview in January 1953, referred to above, Dr. Gregory stated that Dr. Bittner had been a close personal friend of his for some years, and that he had discussed his research and theories with Dr. Bittner, who had endorsed all his claims concerning the virus etiology of cancer.

Such support from so eminent a scientist, if verified, warranted respect, and a letter of inquiry was sent to Dr. Bittner.

Under date of January 31, 1953, Dr. Bittner wrote as follows: "While it is possible I have met [Dr. Gregory] at a meeting, I do not remember him and so could not call him a 'close personal friend.' I might add that I have checked my file and I am unable to find any correspondence with Dr. Gregory."

After some remarks about the nature of the mammary mouse agent, Dr. Bittner made the following comments: "If the agent acted like a typical cancer virus, we would be unable to explain many of our data, but if the agent was comparable in action to an enzyme, the interpretation of the results would be possible. With the possible exception of leukemia, there is no evidence that there may be an agent involved in the development of other types of cancer in mice. By using some immune sera produced in rabbits and guinea pigs, we have been able to produce passive immunity against the agent. *However, if the mice obtained the agent first, treatment with the serum did not alter the incidence or the course of the disease.*"

In the last sentence quoted from Dr. Bittner the italics are supplied to point up the fact that, even if

Gregory's unsupported claim that cancer in mice and men is the same disease were true, here is reliable evidence from one of the world's authorities in the field that the one form of cancer in mice associated with a virus-like agent is not altered by the application of Gregory's own theories.

Nevertheless, the Commission wanted to give Dr. Gregory an opportunity to present his work to a qualified expert in the field. This step seemed desirable because of the uncertainty of attempts at interpretation of the bodies appearing in Gregory's electron micrographs which he claims to be viral bodies. Several workers of experience who have seen some of these photographic reproductions offered equivocal opinions, one medical microbiologist saying that he believed them to be cytoplasmic inclusion bodies. At the request of the Commission, Dr. Richard Baker of the University of Southern California, who has been associated in the development of new techniques in the use of the electron microscope, agreed to visit Dr. Gregory's laboratory and undertake a first-hand review of his work. The chairman of the Commission requested that such an arrangement be made and Dr. Gregory readily agreed. On two occasions Dr. Baker tried to make an appointment by telephone, and met with evasions and excuses.

#### 10. General Comments

The Commission was originally reluctant to undertake a full-fledged investigation of Dr. Gregory's methods, for the cry of persecution invariably resounds when an individual advocate of the unconventional is investigated. Indeed, before there was any formal attempt to survey Dr. Gregory's activities, the claim of persecution was being made when attempts at securing further publicity in major newspapers met with failure. Eventually the number of complaints, formal and informal, and the Commission's realization of Dr. Gregory's attracting increasing numbers of patients from a wide area, made an investigation mandatory. The members of the Commission wish to emphasize that its officers approached this study, as in the case of previous proposed remedies, with the intent only of determining the truth to the best of their ability. It is a matter of regret that none of the agents so far studied have withstood critical survey. The Commission's experience in these surveys illustrates convincingly that the vagaries of cancer are such that the use of distilled water could in at least occasional patients be associated with a course of events which an inexperienced or biased observer might report as evidence of its therapeutic value.

#### 11. Conclusions of the Commission

The treatment of cancer by John E. Gregory, M.D., is based on his claim that all human cancer is associated with the presence of a single virus, a pos-



sibility that no other scientist or institution has been able to establish. Assuming thus that human cancer is an infectious process, and identical with a few forms of animal cancer known to be of viral origin, Dr. Gregory claims to have developed a vaccine and more recently to have discovered an antibiotic (Gregomycin), effective in the treatment of human cancer.

The evidence accumulated by the Commission lends no support to these claims, either as to the role of a viral agent in the production of human cancer, or as to any established value for Dr. Gregory's methods of treatment. In January 1953, Dr. Gregory informed representatives of the Commission that he had treated about 100 cases of cancer and that "20 per cent have cleared up." Several months later the

Commission had found a total of 82 death certificates from three cities, signed by Dr. Gregory or his assistants, on which the cause of death was stated as cancer. With one possible exception, probably due to natural remission, members of the Cancer Commission could find no objective clinical or pathologic evidence of real control of cancer by the Gregory method of treatment alone. In common with other non-curative agents, notable subjective improvement is apparent in some patients.

Laboratory tests by qualified consultants indicate that "Gregomycin" has no antibiotic or antiviral activity, and that it fails completely to control certain animal neoplasms and types of leukemia which respond readily to chemotherapeutic agents of some established value.

## Council Meeting Minutes

*Tentative Draft: Minutes of the 404th Meeting of the Council of the California Medical Association, Los Angeles, January 30, 1954.*

The meeting was called to order by Chairman Shipman in the Foy and St. Louis Rooms of the Hotel Statler, Los Angeles, at 9:30 a.m., Saturday, January 30, 1954.

### Roll Call:

Present were President Green, President-elect Morrison, Speaker Charnock, Vice-Speaker Bailey, Secretary Daniels, Editor Wilbur and Councilors West, Wheeler, Loos, Sampson, Pearman, Ray, Shipman, Lum, Bostick, Teall, Varden, Heron, Frees, Carey, Kirchner, and Reynolds.

Absent because of illness, Councilor Dau.

A quorum present and acting.

Present by invitation were Messrs. Hunton, Thomas, Gillette, Clancy and Pettis of C.M.A. staff; legal counsel Hassard; Ben H. Read of the Public Health League of California; Rollen Waterson, executive secretary of the Alameda-Contra Costa Medical Association; Dr. Wilton L. Halverson, state director of public health; Dr. Samuel R. Sherman, president of the San Francisco Medical Society; Dr. James C. Doyle of Los Angeles; Mr. Louis L. Welsh of legal counsel; and Messrs. Arthur J. Manley and Fred O. Field, attorneys.

### 1. Minutes:

(a) On motion duly made and seconded, minutes

of the 403rd meeting of the Council, held December 11-13, 1953, were approved.

(b) On motion duly made and seconded, minutes of the 238th meeting of the Executive Committee, held December 11-13, 1953, were approved.

(c) On motion duly made and seconded, minutes of the 239th meeting of the Executive Committee, held December 23, 1953, were approved.

(d) On motion duly made and seconded, minutes of the 240th meeting of the Executive Committee, held January 13, 1954, were approved.

### 2. Membership:

(a) A report of membership as of January 27, 1954, was received and ordered filed.

(b) On motion duly made and seconded, 25 members whose 1953 dues had been received since the previous Council meeting were voted reinstatement.

(c) On motion duly made and seconded in each instance, seven applicants were voted Retired Membership. These were: Edwin S. Bennett, Raymond J. Cary, Arthur D. Cooley, Walter R. Crane, Benjamin H. Hager, Los Angeles County; Floyd W. Gardner, San Bernardino County, and John Homer Woolsey, Yolo County.

(d) On motion duly made and seconded in each instance, eleven applicants were voted Associate Membership. These were: Ivan F. Edmister, Edward T. Knowles, John R. Skahne, Alameda-Contra Costa; C. G. Holland, Jr., Meredith A. Van Pelt, Kean F. Westphal, Fresno County; Frank E. Kliman, Wil-

liam S. Murry, Dean S. Pocock, Los Angeles County; Robert J. Bain, George A. Butler, Orange County.

(e) On motion duly made and seconded in each instance, reductions of dues were granted nine applicants because of illness or postgraduate study.

### 3. *Financial:*

A report of bank balances of January 27, 1954 was received and ordered filed.

### 4. *State Department of Public Health:*

Dr. Wilton L. Halverson, state director of public health, discussed the possible testing of the new poliomyelitis vaccine, under which second-grade school children would be given three injections and first- and third-grade children used as controls. A physician has been named to supervise such testing in selected areas in several states; until such sample testing has been done, the California department has been unwilling, with the knowledge and consent of its Advisory Committee, to undertake mass injections in California.

In response to a question, Dr. Halverson stated that no conclusive evidence is yet available on the effectiveness of community inoculations with gamma globulin.

### 5. *California Medicine:*

Mr. Hunton placed before the Council the question raised by the Committee on Advertising of CALIFORNIA MEDICINE as to whether or not cigarette advertising should be accepted by the journal. On motion duly made and seconded, it was voted to take this matter under advisement.

### 6. *Committee on Scientific Work:*

Dr. Daniels, chairman of the Committee on Scientific Work, presented a list of guest speakers proposed for the 1954 Annual Session who are not members of the Association. On motion duly made and seconded, these speakers were approved for inclusion in the program.

### 7. *Legal Department:*

(a) Mr. Hassard reported that Audio-Digest Foundation is now being formed and that \$10,000 of the maximum \$20,000 loan approved by the Council had been advanced. An exemption from state corporation and franchise taxes has been granted as an educational organization. On motion duly made and seconded, it was voted that any surplus earnings of Audio-Digest be devoted to medical education.

(b) Mr. Hassard reported that the Alameda-Contra Costa Medical Association had won the court case under which a member who had been expelled had petitioned the court to set aside the medical society judgment, reinstate him as a member and

assess damages against the society. The expelled member has the right to appeal the decision against him to the District Court of Appeals.

(c) Mr. Hassard reported that oral arguments had been heard by the State Supreme Court in the case originally brought against the San Diego County Medical Society by Complete Service Bureau. The court's opinion is expected within the next few months.

(d) In a disciplinary hearing scheduled by a small county medical society, Mr. Hassard sought the Council's opinion as to whether or not a county society lay executive secretary might be named as a referee. It was the Council's opinion that this should not be done.

(e) Nominations for trustees of California Physicians' Service, due to be made by the Council 30 days before the Annual Session, were discussed and the Councilors asked to be prepared to submit names prior to the next Council meeting. It was agreed that the chairman should discuss with a previous trustee his willingness to serve a new term on the board of trustees.

### 8. *Public Policy and Legislation:*

Dr. James C. Doyle, member of the Committee on Public Policy and Legislation, reported on a national legislative meeting held in San Francisco on January 23, members present from California, Oregon, Washington, Idaho and Nevada. A general review of national legislation was held.

Mr. Ben H. Read, executive secretary of the Public Health League of California, reported that the state Senate Interim Committee on Licensing of Professions would meet in Sacramento starting March 1 and that the Association would be represented.

On motion duly made and seconded, it was voted to table action on a proposal for subsidizing student public health officers and other personnel.

### 9. *Public Relations:*

Mr. Ed Clancy reported on several television programs undertaken by county medical societies and urged that such programs be maintained on a public service basis and not permitted to come under commercial sponsorship.

### 10. *Memorial to George H. Kress, M.D.:*

On motion duly made and seconded, it was voted to rise in the memory of Dr. George H. Kress, former president, secretary and editor of the Association, and that a suitable resolution be prepared and sent to Mrs. Kress.

### 11. *Appreciation to Edward J. McCormick, M.D.:*

On motion duly made and seconded, it was voted to express to Dr. Edward J. McCormick of Toledo, Ohio, the appreciation of the Association for his fine

contribution to the public relations of medicine during the course of five speaking engagements in California.

#### 12. Medical Secretaries:

Dr. Frees presented a proposal for the formation of a national organization of medical secretaries. It was agreed to forward this proposal to the Committee on Associated Societies and Technical Groups for consideration and report.

#### 13. Medical Society of the State of California:

Mr. Hassard reported that some of the trustees of the Medical Society of the State of California had suggested that that organization become inactive. On motion duly made and seconded, it was voted to authorize the Executive Committee to meet with the trustees of MSSC to discuss this matter and to preserve the name of the organization.

#### 14. Benevolence Committee:

On motion duly made and seconded, it was voted to request the Benevolence Committee to investigate the financial needs of Mrs. George H. Kress.

#### Adjournment:

There being no further business to come before it, the meeting was adjourned at 5:10 p.m.

### Executive Committee Minutes

*Tentative Draft: Minutes of the 241st Meeting of the Executive Committee, Los Angeles, January 30, 1954.*

The meeting was called to order by Chairman Lum in the Foy and St. Louis Rooms of the Hotel Statler, Los Angeles, on Saturday, January 30, 1954, at 5:15 p.m.

#### Roll Call:

Present were President Green, President-elect Morrison, Speaker Charnock, Council Chairman Shipman, Auditing Committee Chairman Lum, Secretary Daniels and Editor Wilbur.

A quorum present and acting.

Present by invitation were Messrs. Hunton, Pettis and Gillette of C.M.A. staff, legal counsel Hassard and Dr. Edward C. Rosenow.

#### 1. Women's Organizations:

Dr. Morrison reported that he had been invited to meet with the leaders of women's organizations in Ventura County to discuss the overall questions of medical care for the people. On motion duly made and seconded, it was voted to authorize the president to participate in such a meeting and to report back to the Council on its outcome.

#### 2. Audio-Digest Foundation:

Dr. Rosenow reported on the start of Audio-Digest Foundation and stated that he proposed to ask Mr. K. L. Hamman, executive vice-president of California Physicians' Service, to review the business setup of the organization.

#### Adjournment:

There being no further business to come before it, the meeting was adjourned at 5:40 p.m.

### 242nd Meeting

*Tentative Draft: Minutes of the Executive Committee, San Francisco, February 24, 1954.*

The meeting was called to order by Chairman Lum in Room 214 of the Sir Francis Drake Hotel, San Francisco, at 5:45 p.m., Wednesday, February 24, 1954.

#### Roll Call:

Present were President Green, President-elect Morrison, Council Chairman Shipman and Auditing Committee Chairman Lum. Absent for cause, Speaker Charnock. Ex-officio members absent for cause, Editor Wilbur and Secretary Daniels.

A quorum present and acting.

Present by invitation were Messrs. Hunton, Clancy and Thomas of C.M.A. staff and legal counsel Hassard.

#### 1. Public Relations:

Mr. Clancy made a report on the activities of the public relations department to date and discussion was held on proposed means of maintaining the principle of freedom of choice of physicians. On motion duly made and seconded, it was voted to retain Rollen Waterson Associates as health insurance consultants, to develop a program to meet the needs of the Association in maintaining freedom of choice of physicians.

#### 2. Secretarial Conference:

On motion duly made and seconded, it was voted to invite to the 1954 Secretarial Conference the presidents of the component societies.

#### 3. State Department of Public Health:

On motion duly made and seconded, it was voted to recommend to the Governor the appointment of Dr. Malcolm Merrill as State Director of Public Health.

#### 4. Health Insurance Conference:

On motion duly made and seconded, it was voted to have Mr. Rollen Waterson of Rollen Waterson Associates represent the Association at a health in-

surance conference scheduled by the San Francisco Labor Council.

#### 5. Meeting with Women's Organizations:

Dr. Morrison reported on a meeting held with representatives of women's organizations in Ventura County, during which he was called upon to answer numerous inquiries relative to the availability, cost and other features of health insurance. Further meetings are planned.

#### Adjournment:

There being no further business to come before it, the meeting was adjourned at 9:30 p.m.

### Medical Dates Bulletin

THIS BULLETIN of the dates of postgraduate education assemblies and the meetings of various medical organizations in California is supplied by the Committee on Postgraduate Activities of the California Medical Association.

#### APRIL

California Medical Association Institute for Sacramento Valley Counties, Sacramento, April 15-16.

Alumni Committee, Children's Hospital, one-day seminar, San Francisco, April 24.

California Medical Association Institute for Southern Counties, Palm Springs, April 22-23.

American Academy of Nutrition, Pasadena, April 30-May 1.

#### MAY

California Medical Association Convention, Los Angeles, May 9-13.

Clifford Sweet Lectureship, Children's Hospital of the East Bay, Oakland, May 26-28.

#### JUNE

American Medical Association, Annual Session, 1954, San Francisco, June 21-25.

American Geriatrics Society, San Francisco, June 17-19.

#### OCTOBER

California Society of Internal Medicine, Yosemite National Park, October 2.

Los Angeles County Heart Association, Annual Professional Symposium on Heart Disease, October 13-14.

California Academy of General Practice, Sixth Annual Scientific Assembly, Los Angeles, October 24, 25, 26, 27.

#### C.M.A. REGIONAL AND MEDICAL INSTITUTES

SACRAMENTO VALLEY COUNTIES, Sacramento, April 15-16.  
SOUTHERN COUNTIES, Palm Springs, April 22-23.

#### AMERICAN MEDICAL ASSOCIATION

Annual Session, 1954, San Francisco, June 21-25.

Clinical Session, 1954, Miami, November 30-December 3.

Annual Session, 1955, Atlantic City, June 6-10.

Clinical Session, 1955, Boston, November 29-December 2.

### In Memoriam

ABBOTT, FRED E. Died in Santa Ana, September 24, 1953, aged 70, of coronary occlusion and arteriosclerosis. Graduate of Rush Medical College, Chicago, Illinois, 1908. Licensed in California in 1923. Doctor Abbott was a member of the San Diego County Medical Society.

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BARNHART, WILLIAM. Died in Los Angeles, February 22, 1954, aged 78. Graduate of the University of Southern California School of Medicine, Los Angeles, 1906. Licensed in California in 1906. Doctor Barnhart was a retired member of the Los Angeles County Medical Association.

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BARTLETT, EDWIN I. Died in Millbrae, February 2, 1954, aged 70, of coronary artery disease. Graduate of the Johns Hopkins University School of Medicine, Baltimore, Maryland, 1912. Licensed in California in 1917. Doctor Bartlett was a retired member of the San Francisco Medical Society.

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BUCKELL, ALFRED E. T. Died in Oakland, January 23, 1954, aged 75, of acute myocardial infarction. Graduate of the University of Oregon Medical School, Portland, 1906. Licensed in California in 1917. Doctor Buckell was a member of the Alameda-Contra Costa Medical Association.

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GARDNER, FRANK M. Died in San Bernardino, February 15, 1954, aged 76, of acute myelogenous leukemia. Graduate of the New York Medical College, New York, 1904. Licensed in California in 1912. Doctor Gardner was a member of the San Bernardino County Medical Society.

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KOENECKE, HENRY J. Died in Salinas, January 23, 1954, aged 63, of coronary artery disease. Graduate of the College of Physicians and Surgeons of San Francisco, 1919. Licensed in California in 1919. Doctor Koenecke was a member of the Monterey County Medical Society.

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LESSER, ROBERT P. Died in San Francisco, January 16, 1954, aged 62, of coronary occlusion. Graduate of Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1918. Licensed in California in 1937. Doctor Lesser was a member of the Alameda-Contra Costa Medical Association.

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MARCHILDON, JOHN W. Died January 29, 1954, aged 78. Graduate of Rush Medical College, Chicago, Illinois, 1903. Licensed in California in 1925. Doctor Marchildon was a retired member of the Los Angeles County Medical Association.

+

McGREW, WILLIAM R. Died in Oakland, January 22, 1954, aged 79. Graduate of Keokuk Medical College, Iowa, 1903. Licensed in California in 1932. Doctor McGrew was a retired member of the Alameda-Contra Costa Medical Association.

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MOQUIN, WILLIAM N. Died in San Diego, December 12, 1953, aged 39. Graduate of the University of Southern California School of Medicine, Los Angeles, 1952. Licensed in California in 1952. Doctor Moquin was an affiliate member of the Ventura County Medical Society.

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SQUIBB, JOSEPH W. Died January 4, 1954, aged 49. Graduate of Washington University School of Medicine, St. Louis, Missouri, 1931. Licensed in California in 1936. Doctor Squibb was a member of the Los Angeles County Medical Association.



# NEWS & NOTES

## NATIONAL • STATE • COUNTY

### LOS ANGELES

Dr. George Uhl, health officer for the City of Los Angeles, has been appointed by Governor Goodwin Knight to California's new Building and Standards Commission. The purpose of the new commission is to study various building codes with a view to eliminating conflicting and redundant sections.

\* \* \*

Tentative Program of the meeting of the **American College of Chest Physicians**, California Chapter, to be held in Los Angeles, May 8, is as follows:

Business Meeting, 12:30-1:30 p.m.,

Scientific Program, 1:30-4:30 p.m., as follows:

*The Medical Surgical Team in the Treatment of Mitral Stenosis*, Joseph F. Sadusk, Jr., M.D., by invitation. Discussion by David Dugan, M.D.

*Personality and Tuberculosis*, Barbara M. Stewart, Ph.D., and Shalom E. Vineberg, Ph.D., by invitation.

*Minifilm Utilization After a Chest Survey*, Blanche Perkins, by invitation, and Emil Bogen, M.D.

*Management of Diaphragmatic Hernia in the Aged*, Byron H. Evans, M.D., by invitation, and Joseph B. Ford, Jr., M.D., by invitation.

*Diagnostic Use of Pneumoperitoneum in Non-Tuberculous Diseases*, Harold G. Trimble, M.D., and William B. Leftwich, M.D., by invitation.

*Bronchial Diseases in Childhood Tuberculosis*, Henry J. Rubin, M.D., by invitation, and Marvin S. Harris, M.D.

\* \* \*

Dr. Robert A. Ulstrom, assistant professor of pediatrics at the University of California at Los Angeles Medical School, has been awarded a \$30,000 scholarship for medical research by the John and Mary R. Markle Foundation of New York. He is one of 25 faculty members of medical schools in the United States and Canada so honored by the philanthropic foundation. The grant will be awarded in the sum of \$6,000 annually during a five-year period. Dr. Ulstrom's research will be concerned primarily with metabolism and the function of endocrine glands in children.

\* \* \*

Dr. Lawrence A. Williams of Pasadena has been elected a member of the board of trustees of the California Institute of Technology, according to recent announcement by L. A. DuBridge, president of the Institute.

### MARIN

The regular monthly meeting of the **Marin County Medical Society** was held on February 25th at the Meadow Club, Fairfax. Dr. Leo L. Stanley, president, called the meeting to order at 8 p.m. The subject was: "Meet Your C.M.A. Officers." Present by invitation were: Dr. Arlo A. Morrison, C.M.A. president-elect, Mr. John Hunton, C.M.A. executive secretary, and Mr. Ben H. Read of the Public Health League of California. In the absence of Dr. C. A.

Russell, program chairman, speakers of the evening were introduced by Dr. Warren L. Bostick, Councilor for the tenth district.

### SAN BERNARDINO

Dr. T. Robert White of Redlands has accepted an invitation of the Swiss Organizing Committee for the International Congress on Gynecology and Obstetrics to read a paper before the Congress, which is to be held in Geneva, Switzerland, July 26-31, 1954. Dr. White's subject will be "Practical Experience with the Papanicolaou-Traut Vaginal Smear."

### SAN FRANCISCO

The **American Cancer Society's** award for distinguished service in cancer control was presented last month to Dr. L. Henry Garland, of San Francisco, who is secretary of the Cancer Commission of the California Medical Association.

Presentation ceremonies were carried out at a dinner attended by the Society's board of directors, who were holding a meeting in San Francisco.

\* \* \*

**Alumni of the University of Pennsylvania Medical School** will meet for dinner at the Sir Francis Drake Hotel, San Francisco, at 7 o'clock Wednesday, June 23, the third day of the meeting of the American Medical Association. Dr. John K. Mitchell, dean of the medical school, will be the speaker of the evening.

Tickets for the dinner may be purchased at the registration desk of the A.M.A. convention.

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**Alumni of Tufts Medical College** will hold their convention dinner at John's Famous Grill, 63 Ellis Street, San Francisco, on Wednesday, June 23, the third day of the meeting of the American Medical Association. Dinner will be at 8 p.m. and the charge will be \$6.00 per person, according to Dr. John F. Martin, president of the Tufts Alumni Association of California.

Alumni are requested to apply for reservations early, and to send a check with the request. Requests should be sent to Dr. M. Coleman Harris, chairman of the dinner committee, 450 Sutter Street, San Francisco.

\* \* \*

The **38th annual tournament of the American Medical Golf Association** will be held at the Olympic Country Club, San Francisco, Monday, June 21, 1954. Prizes for winners—there were 311 competitors and 311 winners at the 1950 tournament in San Francisco—will be awarded at a dinner at the Olympic Club.

Dr. Paul Wyne, tournament chairman, has expressed hope that a large number of California physicians will participate in the tournament and help entertain out-of-state entrants. Any member of the A.M.A. may compete and no advance registration is required.

### SANTA CLARA

Dr. Hyman Tucker has been appointed superintendent and medical director of Agnew State Hospital. The appointment was made by Dr. Walter Rapaport who himself occupied that post until he was recently named state director of mental hygiene by Governor Goodwin Knight.

Dr. Tucker has been serving as assistant superintendent and medical director of Metropolitan State Hospital at Norwalk.

## GENERAL

A statewide **morbidity survey** to study the extent of illness in the population of California will be conducted by the State Department of Public Health beginning May 3. The survey, using methods developed in a pilot study conducted by the department in San Jose during the past two years, will continue for a year under the supervision of Dr. Lester Breslow, chief of the department's Bureau of Chronic Diseases. Trained interviewers selected by the U.S. Census Bureau will reach 35,000 people in approximately 12,000 households throughout the state.

The survey will cover all types of diseases and injuries and will determine not only the nature and amount of illness among Californians, but also how much time is lost from work because of it, and the extent to which medical attention and hospitalization are secured. It is anticipated the survey will answer questions such as: What are the major and minor causes of sickness today? How many invalids are there? Does health actually fail rapidly after age 65?

\* \* \*

Wayland D. Hand, professor of German and folklore at the University of California at Los Angeles, who received a Guggenheim Foundation fellowship to compile a dictionary of American superstitions, has appealed to the medical profession for information on **folk medicine and related lore**. A postcard addressed to him at UCLA, Los Angeles 24, will bring free of charge a prospectus telling of the project and examples of the kind of material wanted.

\* \* \*

At the American Medical Association's ninth **National Conference on Rural Health**, held in Dallas, March 4-6, Dr. Henry Randel, Fresno, chairman of the California Medical Association's Committee on Rural Health, discussed "The Physician's Responsibility to His Community" at the opening session. Dr. Randel stressed the need for greater participation by physicians in local affairs "if we are to merit the community's interest in our particular problems." Also from California were: Dr. J. Frank Doughty, Tracy, a member of the Council on Rural Health and regional director for California, Arizona and Nevada; Dr. Carroll B. Andrews, Sonoma; Mr. Glenn W. Gillette of the C.M.A. public relations department; and Mrs. Charlotte E. Nye, Napa, rural health department, California Farm Bureau Federation.

## POSTGRADUATE EDUCATION NOTICES

### UNIVERSITY OF CALIFORNIA AT LOS ANGELES

Three-Day Symposia: Office Otolaryngology—April 29;  
Office Urology—April 30; Office Proctology—May 1.

Anesthesia—May 13-14.

Techniques of Hypnosis—May 18-19.

Electrocardiography—June 2-18.

Laboratory Technicians Symposium—June 19-20.

Contact: Mrs. Margaret H. Griffith, Assistant Head of Postgraduate Instruction, Medical Extension, University of California, Los Angeles 24, California.

### UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Course in Internal Medicine, American College of Physicians

Date: June 14 through 18, all day, University of California Extension Building, 540 Powell Street, San Francisco.

#### Conference on General Surgery

Date: September 13 through 17, all day, at Medical Center. This conference will be offered for the purpose of stressing the newer concepts, methods of diagnosis, treatment and techniques in surgery. Throughout the session emphasis will be placed on the diagnosis and treatment of malignant lesions. Instruction will consist of didactic periods, panel discussions, and actual operative demonstrations which will be televised from the operating room to the lecture hall. This program will be designed for general practitioners who are doing surgery. The class will be limited.

#### Conference on Fractures and Diseases of the Bone

Date: September 20 through 23, all day, San Francisco County Hospital. The program will cover the newer concepts, methods of diagnosis, treatment and techniques. There will be didactic lectures, panel discussions, and actual demonstrations of illustrative cases. The class will be limited.

#### Medicine for General Practitioners

Date: September 21 to December 7, Tuesday evenings, East Oakland Hospital, Oakland. This is a continuation course which is offered every year, with complete change of program and speakers. Class limited.

#### Evening Lectures in Medicine, Part I and Part 2

Date: September 16 through December 9, Thursday evenings, Mills Memorial Hospital, San Mateo. This is also a continuation course which will be of interest to both internists (Part 1) and to physicians in general practice (Part 2).

#### Symposium on Endocrine Diseases and Geriatrics

Date: October 22, 23, 24 (week-end), University of California Extension Building, 540 Powell Street, San Francisco. A review of recent developments in both fields, with suggestions for the management of patients past the age of fifty.

#### Microscopy (Part 1)

Date: January 14 through March 18, Thursday evenings, Medical Center.

#### Photomicrography (Part 2)

Date: April 1 through June 3, Thursday evenings, Medical Center. Part 2, Photomicrography, in monochrome and in color, cannot be taken without Part 1, but Part 1, Microscopy, which includes the critical use of the microscope, may be taken alone. These courses are open to any persons who are interested in the study of the topics listed above. Class limited.

Contact: Stacy R. Mettier, M.D., Head of Postgraduate Instruction, Medical Extension, University of California Medical Center, San Francisco 22, California.

### C.M.A. REGIONAL MEDICAL AND SURGICAL INSTITUTES

Southern Counties, Palm Springs, April 22-23, 1954.

Contact: C. A. Broadbuss, M.D., Director, Postgraduate Activities, California Medical Association, 1036 N. Center Street, Stockton, California.

## COLLEGE OF MEDICAL EVANGELISTS

Diseases and Injuries of Bones and Joints (4 weeks)  
Full time.

Date: July 5 through 30, 1954. Dr. Taylor's office and various hospitals. Tuition: \$100.00. G. Mosser Taylor, M.D., Alonzo J. Neufeld, M.D., and Associates. Unless otherwise stated or arranged, courses will be held in Osler House, corner State and Michigan Avenues.

Contact: Chairman, Section on Graduate and Postgraduate Medical Education, College of Medical Evangelists, 312 North Boyle Avenue, Los Angeles 33, California.

## ORTHOPAEDIC HOSPITAL AND RANCHO LOS AMIGOS RESPIRATORY CENTER, LOS ANGELES

Care of the Poliomyelitis Patient—April 26-30. The course is designed to cover all phases of patient care and rehabilitation, including use of the respirator.

Contact: Polio Teaching Program, Orthopaedic Hospital, 2400 South Flower Street, Los Angeles 7.

## STANFORD UNIVERSITY SCHOOL OF MEDICINE

Conference on Growth and Adaptation in Childhood  
Date: June 12 to 19 inclusive, 1954.

For General Practitioners, Pediatricians and Public Health Physicians, to be presented by the Pediatric Department, the Pediatric-Psychiatric Unit, the Division of Neuropsychiatry.

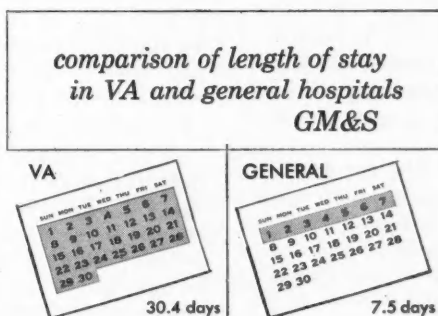
Contact: Office of the Dean, Stanford University School of Medicine, 2398 Sacramento Street, San Francisco 15.

## SEMINARS OF THE ALUMNI COMMITTEE OF THE CHILDREN'S HOSPITAL, SAN FRANCISCO

April 24, 1954—Childhood Ecology, with a discussion of physical, mental and emotional growth and development of the young child; the effects of deprivation of maternal care, and the impact of environment on the child.

A fee of \$15.00 will be charged for attendance at all the seminars and those who wish to have further details or be on the mailing list for such details may write to: H. E. Thelander, M.D., Children's Hospital, 3700 California Street, San Francisco.

## In Viewing the VA Medical Program . . .



General medical and surgical patients in VA hospitals are confined four times longer than in non-federal hospitals. VA hospitals admit patients for examination, diagnosis, and treatment, much of which is normally undertaken outside civilian hospitals. Also, VA patients often remain hospitalized throughout the entire medical treatment period, whereas non-VA patients are usually treated at home during their convalescence. This is a major factor in the tremendous cost of the VA medical program.

# INFORMATION

## The Present Shortage of Interns

### *The Responsibility of the Medical Profession to Educational Standards*

FRANCIS SCOTT SMYTH, M.D., San Francisco  
Dean, University of California School of  
Medicine, San Francisco

THE PRACTICE OF MEDICINE in the last three decades has placed considerable importance upon hospitals, their facilities and personnel. Increasingly, the hospital, its superintendent and the professional staff have come to depend on interns and residents for smooth functioning in the many aspects of care of patients.

At present the demand for interns greatly exceeds the supply of graduates of the American schools of medicine, and is part of the overall shortage of American physicians. This shortage relates, first, to the population increase of the country; second, to the demands of the military forces in their remobilization; and third, to the increasing demand for medical personnel in legislated expansion of programs related to health (for example, the Veterans Administration).

Further to complicate the situation, many foreign schools of medicine are producing more physicians than are locally needed, and their graduates are, in a sense, for export. As a result, many hospitals have sought and are obtaining graduates of foreign medical schools to fill vacant internships. Many of the graduates are American students, often rejectees from American schools of medicine who have obtained easy admittance to foreign schools at low cost and/or under subsidy by "G.I. bill" or other funds.

A second group are foreign students selected by their country for experience and education in the United States. As a world center for medical education and in the interest of international understanding, we cannot shirk the responsibility for supplying schooling in such circumstances. But whether subsidized by private foundations, by the Institute of International Education, by the U. S. Public Health Service or other sources, the premise and purpose of education and training of this type is mutual aid and exchange, but not immigration. Failing this purpose by carelessness in responsibility, the program might be jeopardized and could well alienate international understanding rather than foster it.

Not to be confused with the second group are an uncertain number of foreign graduates who seek by their own means or any other resource to emigrate to this country. In this group are the many displaced physicians.

Experience with many, if not most, of foreign medical school graduates as interns, is disappointing in comparison with experience with those graduating from American schools. Many of the foreign graduates (whether on visitor's visa or not) try to stay here and become licensed in the United States; hence, unless carefully supervised, the present use of graduates of foreign schools poses a grave threat to our professional standards and educational institutions.

The writer has no argument against carefully selected graduates of foreign schools who meet our standards. He is concerned with the indiscriminate importation of foreign graduates, which can defeat the purposes of educational exchange or undermine our own standards.

One proposal has been to accredit certain foreign schools by the same methods of inspection and by the same standards as those used for American schools. It is the writer's opinion that such a program, if strictly followed, would accredit very few schools, would entail greater effort and time, and would create considerable misunderstanding with our foreign colleagues. In a sense it is presumptuous to undertake to dictate to a foreign country the kind of medical education it should have, when it has developed this education to meet its own needs.

In many instances, hospitals have been given the right to issue their own permits for visas (Project Nos. P12 to P1644). This permit implies responsibility in seeing that the visitors return to their own country. Too often, however, the hospital is unable or unwilling to follow through with the implied responsibility. Frequently a visitor connives to avoid his return and finds ways to perpetuate his stay. The hospital and its staff, if not abetting such dereliction, assume an indifferent attitude or ignorance of the fate of these importations for which they assumed responsibility.

To recapitulate or summarize:

With a scarcity of candidates to fill available internships, graduates of foreign medical schools are being sought by many hospitals. These graduates may be grouped into four categories:

1. Americans who, failing to obtain admittance to schools in this country, have been admitted to foreign schools where costs and curriculum are often lower than those in American schools. This group, unquestionably, exerts considerable political pressure, and intends to become licensed in this country. If the tendency is not checked, the standards of our



own schools are threatened by competition with those of lower standing.

2. Bona fide selected foreign graduates, who are selected by their government for training in this country. They must not be neglected or exploited, but should be considered ambassadors whose obligation is to return, not to emigrate.

3. Foreign graduates, particularly from countries educating more physicians than they need, who are seeking to emigrate to more favorable economic areas.

4. Displaced persons and physician immigrants, few of whom will qualify for licensure. Some may be salvaged by postgraduate or special educational "make-up" experience.

It is not the purpose of this report to discuss the means by which the graduates of foreign schools, who plan or wish to immigrate, may be accommodated without a threat to our standards. Some selective differentiation may be possible by postgraduate education, the use of the National Board examination, or individualized selection for hospital positions. At present, the most acute need is to prevent the undermining of our own high standards in both medical education and the quality of internships in our numerous hospitals. In this, hospital superintendents and professional staff alike share responsibility.

## **Report of the Joint Committee On Chest X-Ray\***

Reprinted from "Diseases of the Chest," Official Journal of the American College of Chest Physicians

### *Purpose of Joint Committee on Diseases of the Chest*

In establishing a Joint Committee on Diseases of the Chest, the purpose of the American College of Chest Physicians and the American College of Radiology is to exchange ideas and to propose guiding principles on the problems involved in routine chest x-rays in hospitals (general, mental, etc.), and mass chest x-ray programs. The Committee agrees: that each physician should be encouraged to have a chest x-ray of all of his patients; that every patient admitted to a hospital, private or public, should have a routine chest x-ray; and that the follow-up for all suspected lesions seen in chest x-ray surveys should be organized very carefully to assure that the patient comes under medical supervision.

\*Approved by Joint Committee on Chest X-ray; American College of Radiology, American College of Chest Physicians, Feb. 4, 1953.

### *Limits of Survey*

Routine chest x-ray examinations should be defined as those examinations of the chest which are conducted to screen persons with abnormal changes of the chest from persons with normal chests. The examinations are screening diagnostic procedures and are not to be considered as clinical diagnostic examinations. The screening method is for the purpose of detecting the presence or absence of a lesion only.

The size of the film which one uses for screening purposes is not of primary importance. The committee believes in principle, however, that when microfilms have been used, a 14x17 inch film is a necessary second step in the screening procedure and the mechanism whereby such is provided in any community shall be determined by the local medical society or the local hospital staff. Survey chest x-rays either in hospitals or in the general population are approved as a screening device if conducted by agencies which utilize well qualified professional and technical personnel and which make sincere efforts to send the positive individuals to qualified local physicians or clinics for proper follow-up.

### *Interpretation and Report*

Interpretation and reporting of medical findings is a medical matter and should bear the signature or identification of the responsible physician.

### *Method of Reporting*

Method of reporting of chest survey studies: This is a local matter and is by prearranged agreement between the employer and the employee in industrial surveys; in other surveys it is in accord with medical ethics, according to local agreement.

### *Type of Reporting*

Type of reporting: The Committee discourages the reporting of suspicious cases as tuberculosis. It believes this to be a clinical diagnosis. The x-ray interpreter should designate the cases that require immediate follow-up as "urgent." The small film x-ray interpretation is merely an impression.

It should be emphasized that the 14x17 inch film is a diagnostic aid and the results derived therefrom are also impressions and not diagnoses. Even the larger film is but one of several examinations necessary in order to establish correct diagnoses.

### *Double Reading*

The Committee notes the several publications indicating the extent of false negative and false positive reports resulting from inter- and intra-individual variations in interpretations of chest films. From these it is evident that failures to detect tuberculosis can be reduced by multiple readings,

but at the expense of increasing the false positives, unless a check mechanism is employed. The simplest elaboration of multiple reading is the independent interpretation of the film by two physicians with referee conference of the two undertaken in those cases in which they disagree. Only those cases on which both agree in conference should be followed.

While such a procedure may result in the detection of a slightly larger portion of all the abnormal cases, it may not be feasible from an economic or personnel standpoint. Groups responsible for survey operations are urged by the Committee to give consideration to double reading as one of the methods by which survey yields may be increased. Availability of financial resources and qualified professional personnel, as well as the need for other services of relative importance, will be determinates in this decision. The Committee, therefore, calls attention to some of the virtues of double reading but does not recommend it unreservedly.

#### *Professional Compensation*

The professional cost of performing routine chest examinations in hospitals: The Joint Committee believes the radiologist and/or chest physician should be compensated just as any other physicians practicing his profession. The procedure is time consuming and places a definite responsibility on the radiologist or chest physician. The Committee likewise felt that in this matter the basic principle of payment is by arrangement between the physician and the hospital or agency involved. In the reading of follow-up films there should also be an individual limit to the number of films which should be read in any one day by one physician and which he should not exceed. The compensation, of course, would have to take into consideration, whether the physician makes the film in addition to interpreting it.

#### *Clothing of Patients*

Whether or not a screening examination can be conducted with the patient fully clothed: Since the number of lesions overlooked because of clothing (2 per cent) is considerably smaller than the normal variations of interpretation that Chamberlin et al. have demonstrated to exist in the reading of photofluorographic films, it is concluded that the examination of clothed persons is as effective a procedure as examination of the undressed persons. Since examination of the fully clothed persons is an easier procedure as compared with the examination of the undressed persons, the Committee agreed that screening examination may be conducted with the patient fully clothed.

#### *Reader's Qualifications*

Qualifications of readers in mass chest surveys:

It was believed at the present time there was no practical method which could be used to evaluate the qualifications of a particular reader. Studies in this respect are being made at the present time. It is hoped that within a short period of time satisfactory testing methods will be available. The committee therefore agreed to leave this matter open for further discussion.

#### *Protection*

The radiation received by all professional, technical and clerical personnel associated with photofluorographic equipment should be continuously monitored by means of film badges or other devices which have been proved to be satisfactory for determining the radiation exposure of personnel.

When an individual receives more than 100 milliroentgens per week, the medical officer in charge of the unit should immediately determine whether the individual has been careless or whether the protective devices of the equipment are at fault.

If the fault lies with the individual, the individual should be informed of the fact and strongly cautioned regarding the dangers of excessive radiation exposure. Failure to regard such warning should be considered as negligence on the part of the individual.

If the fault lies with the equipment or protective devices, the photofluorographic unit should immediately be taken out of commission until such time that measurements of radiation conditions where technical or clerical personnel are required to work will yield radiation exposures less than 100 milliroentgens per week for case loads of 2,500 exposures at 95 kv. and 40 ma. seconds (the average exposure per photofluorographic chest film).

#### *Continuation of Study*

It is recommended that the Joint Committee arrangement continue and that the Joint Committee meet annually, or at the call of the co-chairmen. In an effort to have the Joint Committee act continuously and without interruption, interim ideas should be sent to the co-chairmen, and an exchange of opinion should continue during the intervals between meetings. Recommendations are solicited from all interested in the affairs of the Joint Committee.

#### **JOINT COMMITTEE ON CHEST X-RAY**

*American College of Radiology*—Leo G. Rigler, Minneapolis, Minnesota, Chairman; Sydney J. Hawley, Seattle, Washington; Russell H. Morgan, Baltimore, Maryland; E. P. Pendergrass, Philadelphia, Pennsylvania; Paul C. Swenson, Philadelphia, Pennsylvania.  
*Chicago, Illinois, Chairman*; Robert J. Anderson, Washington, D. C.; Hollis E. Johnson, Nashville, Tennessee; Ed-

*American College of Chest Physicians*—Otto L. Bettag, ward Kupka, Berkeley, California; James H. Stygal, Indianapolis, Indiana.



## THE PHYSICIAN'S *Bookshelf*

**MANAGING YOUR CORONARY.** William A. Brams, M.D. J. B. Lippincott Company, Philadelphia, 1953. 158 pages, \$2.95.

Philosophy has been defined as the attempt to explain phenomena. One of the greatest of the phenomena of the twentieth century is the avidity for medical and quasi-medical obiter dicta on the part of the public. The various special societies devoted to certain diseases (and the raising of funds for the full time staff) are educating the public almost ad nauseam. Indeed, many students of mankind would sooner have John Citizen worry about Mr. Thurber and his works, rather than about their own innards. Be that as it may, the spate of popular writings continues.

The present monograph consists essentially of eight chapters which cover the growing problem of coronary thrombosis, the doctor's diagnosis, the mechanics of cardiac action, the behavior of the heart under attack, and the process of healing. Finally there is a cheerful section on how science is helping you after the heart attack.

One page is enticingly headed "The Picture of Your Heart's Electrical Activity" and is accompanied by "Figure 1—The Typical Changes in the Electrocardiogram Following an Attack of Coronary Thrombosis." This reviewer is no cardiologist, but he is familiar with the vagaries in the interpretation of electrocardiograms, normal and otherwise, even by the most erudite. The wisdom of reproducing such tracings in a popular manual is to be debated.

On pages 36 and 37 there is a graphic description of a lady whose upside-down stomach had squeezed into the front of her chest and pushed her heart violently to one side. It is to be hoped that the writer will submit this phenomenal case to scientific documentation. We wonder who the consulting radiologist was during the dramatically described roentgen examination.

The final chapter culminates with seven segments of sound advice. If followed faithfully by all citizens, it is highly probable that most would rust away rather than wear out. We suspect that it is more entertaining to end our terrestrial existence in the latter manner. Even in a welfare state, living to 120 will be of dubious benefit, unless some bright genius invents a game more entertaining than the chase.

**BASIC PROBLEMS IN PSYCHIATRY.** Edited by Joseph Wortis, M.D., Jewish Hospital of Brooklyn. Grune & Stratton, New York, 1953. 186 pages, \$4.50.

This book of 182 pages consists of an Introduction and Comments, and Conclusions, by Dr. Joseph Wortis, with six chapters by different authors. The Introduction is extremely well written and discusses some very basic material and raises interesting questions. The first chapter on "The Scope and Limitations of Psychiatry," by Dr. Benjamin Pasamanick, questions a number of our basic concepts and ways in which we are dealing with problems, and offers some interesting suggestions. He stresses the view empha-

sized by many sociologists, that juvenile delinquency and crime are usually not a product of psychological disorder, but rather a sign of social dislocation. From this, the conclusion is drawn that the psychiatric treatment of individual delinquents is in general not an adequate way of dealing with these problems. There is further emphasis on the idea that the psychiatrist is a Doctor of Medicine and that in some ways he has been getting away from this approach to psychiatry.

The succeeding chapters on "The Conditional Reflex," "Psychology and Culture," "The Validity of Mental Testing," "Schools of Psychiatry," and "The Psychosomatic Symptoms," are all well done.

Dr. Wortis' comments and conclusions are an excellent summary of the material as presented. This whole book is, in general, simply and clearly written, has much basic material that is of interest and deals with it in a controversial fashion. It will well repay reading it.

\* \* \*

**HOLT PEDIATRICS—12th Edition**—L. Emmett Holt, Jr., Professor of Pediatrics, New York University College of Medicine, and Rustin McIntosh, Carpenter Professor of Pediatrics, Columbia University. Twelfth Edition of Holt's *Diseases of Infancy and Childhood*. Appleton-Century-Crofts, Inc., New York, 1953. 1485 pages, \$15.00.

This twelfth edition of a famous and authoritative text appears under a new title, after an interval of 13 years from the last revision, and has been urgently needed for at least eight years. From the time of the first edition written by the senior author's father in 1896 and through its later revisions at the hands of John Howland, Edwards Park and the present authors, until perhaps the middle 1940s, it remained the outstanding one-volume pediatric text in English in terms of completeness, authority and practical usefulness to both medical students and practicing pediatricians. As a result of the extremely rapid and extensive expansion of knowledge in the field, it had become obsolescent and its place taken by other texts, notably Mitchell-Nelson.

It is gratifying to find the present revision again up-to-date, thorough, authoritative and practically useful. Reflecting the expansion and specialization within pediatrics, individual sections have been prepared by no fewer than 72 contributors in addition to the senior authors. In some instances sections have been written by authorities in non-pediatric fields; among these may be mentioned George W. Thorn, professor of medicine at Harvard, whose chapter on the adrenal gland is outstanding; Frank B. Walsh, associate professor of ophthalmology at Hopkins, who wrote much of the chapter on the eye; and Gilbert F. Otto, also of Hopkins, who prepared the section on parasitology. Frank R. Ford's section on neurology also deserves special mention.

No detailed review of so large a text is possible in short space. Descriptions of the astonishingly multifarious phases

of modern pediatrics are brought up to date: growth and development, acid-base equilibrium and electrolyte balance, neonatal disorders, psychopathology, feeding and diet, cardiovascular disturbances, hematology, endocrinology and infectious diseases are all dealt with both fully and compactly. The practicing pediatrician as well as the pediatric teacher will find this volume indispensable. There is an excellent index, although one misses the bold type used in the earlier edition to indicate the location of the main discussion of a given topic. The many photographs, drawings and diagrams are excellent.

**MORAL THEORY OF BEHAVIOR, THE—A New Answer to the Enigma of Mental Illness—**Frank R. Barta, M.D., F.A.C.P., Director, Department of Psychiatry and Neurology, Creighton University School of Medicine, Charles C. Thomas, publisher, Springfield, 1952. 35 pages, \$2.00.

In this small book Dr. Barta cites refutations of all extant theories of mental illness, and bases his theory on Thomistic and Aristotelian principles of philosophy and psychology which delineate sin and involuntary behavior. He defines mental illness as a variety of involuntary behavior; ignorance, rather than unconscious forces, accounts for the mentally ill person's irrational behavior. Reeducation, in the religious and moral sense, is necessary, and group therapy can be carried out "by physicians untrained in the specialty of psychiatry."

**PSYCHIATRIC AIDE EDUCATION—**Bernard H. Hall, M.D.; Mary Gangemi, R.N., Litt.M.; V. L. Norris, A. B.; Vivienne Hutchens Vail, A.B., P.A.; and Gordon Sawatsky, A.B., P.A.: The report of an experiment conducted by The Menninger Foundation in cooperation with The Topeka State Hospital under a grant from The Rockefeller Foundation. Grune and Stratton, New York, 1952. 168 pages, \$5.75.

Hall's book on the experiment of training 85 selected aides shows clearly the responsibility on the part of both psychiatric nurses and psychiatrists to contribute to further development of psychiatric aide education. Greater use of the psychiatric nurse in the therapeutic team is also a necessity. Response to the interest created by this book is shown by the fact that two national nurses' organizations have combined in order to investigate the problem of functions of the aide and standards of training.

**SEXUAL ADJUSTMENT IN MARRIAGE—**Henry Olsen, M.D., Henry Holt and Company, Inc., 383 Madison Ave., New York 17, 1952. 310 pages, \$6.00.

Although written by a Danish authority on sexual education, this book has many factual errors, e.g., statements that syphilis is almost unknown in persons who are circumcised; that real mental illnesses seldom occur at menopause; and that lasting cure in syphilis cannot be positively proved.

The book is much inferior to our many excellent publications on sexual education and sexual adjustment in marriage.

**FROM FISH TO PHILOSOPHER.** Homer W. Smith, Professor of Physiology, New York University College of Medicine. Little, Brown and Company, Boston, 1953. 264 pages, \$4.00.

In this really exciting book Professor Homer Smith has built around the kidney a bewilderingly erudite history of evolution. The richness of allusion, the wealth of detail leave one almost breathless; Dr. Smith's simple and yet polished style make for delightful and easy reading. And yet the high fidelity to scientific fact takes it quite out of

and above any category of "popular science." This is a book for those with a real desire to be informed and with respect for sound scholarship. They will find it hard to put it down. Professor Smith's almost chilly adherence to proven facts, his stripping of the subject of any trappings of idealism or mysticism are a long step from the day of Darwin and will make some readers a little uneasy as we all are in face of the bare truth. And still one realizes that while this book is very much about fishes it is the work of a first-rate philosopher.

**YEAR BOOK OF OBSTETRICS AND GYNECOLOGY—**Series 1953-1954. Edited by J. P. Greenhill, M.D., F.A.C.S., Professor of Gynecology, Cook County Graduate School of Medicine. The Year Book Publishers, 200 East Illinois Street, Chicago, 1953. 567 pages, \$6.00.

The 1953-1954 series covers the review of articles taken from the journals received from July 1952 to July 1953. It would seem more accurate if the series would be called the 1952-1953 series. When these excellent Year Books are placed on library shelves it would appear more confusing to call them the 1953-1954 series.

Greenhill has presented the articles and his comments in excellent fashion. The Year Book serves two purposes. First, it gives one a summary of many journals not available to the physician, and second, those periodicals which he had and did not read containing important articles are summarized for him.

These Year Books, conveniently arranged in chapters, give ready reference to what is new in a particular subject, as well as furnishing the important literature for writing or discussing papers.

**HYPERTENSIVE DISEASES — Causes and Control.** Henry A. Schroeder, M.D., F.A.C.P., Associate Professor of Medicine and Director, Hypertension Division, Washington University School of Medicine; with many contributors. Lea and Febiger, Philadelphia, 1953. 610 pages, 164 illustrations and 3 color plates, \$10.00.

This monograph represents its author's experiences in the field of arterial hypertension, with emphasis on his views as to pathogenesis and classification. Much space is devoted to the results obtained by the writer and his colleagues in experimental animals and to their views on chemical abnormalities which might provoke or sustain hypertension. One such substance, pherentasin, was discovered by Schroeder in the blood of hypertensive patients and is considered at length (adequate confirmation of the importance or even the existence of this material has not appeared from other laboratories as yet).

A proposed therapeutic regimen using Hyphex (the author's contraction for the combined use of 1-hydrazinophthalazine and hexamethonium) is presented in relation to the antagonism of these agents toward neurogenic stimuli, renal ischemia and pherentasin. Details for the physician's use of Hyphex, commencing with patients in hospital, are given; hypotensive and associated beneficial results are reported in the majority of patients without renal failure. Faint warnings appear regarding late toxic effects which resemble disseminated lupus erythematosus and which have been reported more fully in recent issues of the Journal of the American Medical Association. Relatively few will agree that Hyphex represents a "simple and specific" mode of therapy, none can doubt that it "leaves much to be desired," all may be grateful to Schroeder for his continuing scientific and therapeutic investigations.

Despite warnings that the work is largely a personal record and that it is deliberately provocative, the reader may find himself unpleasantly provoked from time to time by the dogmatic tone. As minor points, one might object to the



discussion of the gallop sound or the repeated use of "microphotograph" and "stethoscope." It seems at least a little inconsistent to "prefer not to tell a patient his pressure unless it is being controlled" (page 381) while requiring self-determination of pressure levels during attempted control by Hyphex (page 484). The use of Rauwolfia is conspicuous by its interesting and nearly total absence from the discussion on therapy.

One somehow misses the broader clinical viewpoint which might have been supplied by more attention to such writers as Ayman. A medical student might even believe from this book, for example, that most hypertensive patients need Hyphex; such an error would not be entirely the fault of the student unversed in the lore of hypertension. For those more advanced who wish the record of Schroeder's work, the volume is highly recommended.

\* \* \*

**A SOURCE-BOOK OF MEDICAL TERMS.** Edmund C. Jaeger, D.Sc., formerly Head, Department of Zoology, Riverside College, Riverside, California, Charles C. Thomas, publisher, Springfield, Illinois, 1953. 145 pages, illustrated, \$5.50.

In this book one may find the origin and meanings of medical terms. The author has assembled the numerous word elements, combining forms, prefixes and suffixes from which modern medical terms have been coined. With each entry examples are given. These, in turn, are broken down into their basic formative elements, a very helpful etymological treatment.

There is little attempt to write formal definitions. The author is inquiring into the origin and literal meaning of words, their applications in special cases, their history, and how they happen to be spelled as they are. The book therefore does not replace a medical dictionary—but it is a valuable supplement.

An introductory section on word-building deals with the basic principles used in the construction of medical words. This can be useful to the student who has had classic languages and then relegated them to his past. (The author recommends it to medical students with the unworthy suggestion that it will be a life saver in examinations!)

The physician interested in etymology will get great pleasure from glancing or browsing through this book. Those interested in medical writing will do well to study it. It can help avoid many of the errors indulged in by those of us whose medical technique is superior to our grammatical technique. The book is at its best when the author is most interested and explains a term in detail or by means of line drawings.

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**THE YEAR BOOK OF DRUG THERAPY (1953-54 Year Book Series).** Edited by Harry Beckman, M.D., Director, Departments of Pharmacology, Marquette University Schools of Medicine and Dentistry, The Year Book Publishers, Inc., 200 East Illinois, Chicago, 1954. 538 pages, \$6.00.

This generally excellent Year Book is heartily recommended to the practicing physician who has not the time to keep closer contact with the literature on therapeutics.

\* \* \*

**A TEXTBOOK OF PATHOLOGY—An Introduction to Medicine—6th Edition.** William Boyd, M.D., Dipl. Psych., M.R.C.P. (Edin.), F.R.C.P. (Lond.), F.R.C.S. (C.), LL.D. (Sask.), D.Sc. (Man.), M.D. (Oslo), F.R.S. (C.), Professor of Pathology, University of British Columbia, Lea and Febiger, Philadelphia, 1953. 1024 pages, 570 illustrations and 32 color plates, \$12.50.

It is safe to say without documentation that Boyd has been read profitably and with delight by the majority of English-speaking physicians and medical students. The mas-

terful command of descriptive writing, the remarkable aptness of metaphor and synonym and the facile readability of the author's style have won and retained for this book its great popularity. Dr. Boyd is to be commended for achieving a significant reduction in the length of the volume at a time when more and more massive new and revised texts appear to be the fashion. A nice sense of relative importance of new ideas, experimental results and factual observations is essential to this end. In this edition, at least 80 items have been added, 20 or more sections have been rewritten completely, and an entirely new section on the skin has been prepared. Seventy additional illustrations and three new color plates have been inserted. All of this has been achieved without loss of continuity, break in style or noticeable conflict.

It is true of the present editions, as well as of the former ones, that many of the black and white figures might be improved; the color plates are not nearly as good as could be achieved. Although many pathologists disagree with various assertions in the text, the intelligent medical student need not be compromised by accepting the generalities as expressed.

This reviewer believes that Dr. Boyd has achieved his goal: a pathology textbook that introduces students to the study of medicine.

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**PEDIATRIC GYNECOLOGY—With Sections on Urology and Proctology—3rd Edition.** Goodrich C. Schauffer, M.D., Assistant Clinical Professor of Obstetrics and Gynecology, University of Oregon Medical School, The Year Book Publishers, Inc., 200 East Illinois Street, Chicago, 1953. 318 pages, \$7.50.

This new edition, appearing six years after the previous one, allegedly represents a complete revision of the text. However, a careful comparison with the previous edition discloses that this is hardly the case. While the length of the book seems to have been decreased by some sixty pages, this has been accomplished by the use of smaller type and by deleting an appendix which listed commercial hormone preparations. A short discussion of the embryological development of the female genitalia, written by an anatomist, has been added as a new chapter. As for the rest of the text, it has been changed here and there by the addition or deletion of a few words, but it really hasn't been revised with any thoroughness. It contains the same discussions of vulvar irritations, masturbation, vaginitis, and problems related to uterine bleeding, or the lack of it, occurring at puberty. Contributors other than the senior author have provided short chapters on pediatric surgery, urology and proctology, and there are two final sections dealing with social and medicolegal aspects of pelvic disease in the young female.

There are a number of things in this volume which are at variance with modern gynecological thought and some of the therapeutic recommendations are phrased in such vague, albeit flowery, language that the reader will find little to aid him in dealing with specific problems. Many of the illustrations are not particularly good and quite a few are badly reproduced. The only new ones are two used in the chapter on embryology, and the only deletion was a full-page plate showing the technique of circumcision. As in the previous edition, the book closes with an appendix listing state agencies administering services to children by virtue of the Social Security Act. This list is offered to assist physicians in solving social problems related to sexual misconduct toward children or by children.

Your reviewer's opinion of this book has not been elevated by the new edition and it cannot be recommended in its present form. Undoubtedly there is a need for a reliable monograph on gynecological disorders in children, and it is hoped that the current volume ultimately will fill this need by virtue of a thorough and painstaking revision.

**THE CHEST—A Handbook of Roentgen Diagnosis—2nd Edition.** Leo Rigler, M.D., Professor and Chief, Department of Radiology, University of Minnesota. The Year Book Publishers, Inc., 200 East Illinois, Chicago, 1954. 380 pages, \$8.00.

The combination of the brief text or handbook with the well-illustrated atlas is a desirable method of presenting certain subjects. The present volume exemplifies this method in neat fashion.

After the usual type of introduction, with consideration of methods of fluoroscopy and roentgenography, there is an excellent section dealing with normal observations of the chest from the roentgenological viewpoint. This is followed by a series of sections on pathologic conditions, in which the various pulmonary systems (bronchi, parenchyma, pleura, mediastinum and so forth) are completely illustrated.

The section on normal bronchography has some new illustrations of the anatomy of the tracheobronchial tree. Some of the segmental bronchi carry numbers at variance with those recommended by the International Committee. With all due respect to Boyden and the author, this must be regarded as unfortunate. At any rate, it might have been desirable to carry both sets of drawings in order that the student and practicing physician might be able to use a terminology consistent with a majority of the literature.

This second edition appears about eight years after the first; it has twenty-eight more pages and several more illustrations, all of excellent quality. The author is Professor and Chief of the Department of Radiology at the University of Minnesota.

**PRACTICAL METHODS IN BIOCHEMISTRY—6th Edition.** Frederick C. Koch, late Frank P. Hixon Distinguished Service Professor Emeritus of Biochemistry, University of Chicago, and Martin E. Hanke, Associate Professor of Biochemistry, University of Chicago. The Williams and Wilkins Company, Baltimore, 1953. 537 pages, \$5.00.

The fact that this is the sixth edition of this laboratory manual indicates its value and popularity. Although a laboratory text in biochemistry, the theory behind each test or group of tests is briefly but clearly discussed, thus emphasizing the significance of the text. The book is comprehensive and especially well designed for students specializing in biochemistry. For medical students, there are illustrative experiments which can be selected for the limited laboratory time in the medical curriculum. Many of the tests described are of little interest to the practical-minded medical student. Experiments are grouped in four parts: The Chemistry of Cell Constituents, The Chemistry of the Digestive Tract, Blood and Urine, and Enzymes, Vitamins and Hormones. An appendix gives general laboratory directions, together with directions for preparation of laboratory reagents, a table of atomic weights and a table of logarithms. There is an extensive index.

**BALLISTOCARDIOGRAPHY—The Application of the Direct Ballistocardiograph to Clinical Medicine—**William Dock, B.S., M.D., F.A.C.P., Professor of Medicine, New York State University College of Medicine; Harry Mandelbaum, M.D., F.A.C.P., Lecturer in Medicine, New York State University College of Medicine; and Robert A. Mandelbaum, M.D., Assistant in Medicine, Jewish Hospital of Brooklyn, The C. V. Mosby Company, St. Louis, 1953. 293 pages, 153 illustrations, \$9.50.

Only a few years ago Dr. Dock and his colleagues discovered that ballistocardiography need not remain in the research laboratory with expensive equipment, but that it could become of great clinical interest and even value. Their discovery, based on remarkable ingenuity in the application of physical principles to simple gadgets, has produced such

a flood of studies that scarcely a month passes without a paper on ballistocardiography in some medical journal.

In this most unusual book, the authors present in clear detail their findings in all types of subjects and patients. They not only discuss the application of ballistocardiography to clinical medicine, but also range far beyond the book's title to add to the reader's knowledge of practical cardiology, cardiac physiology and physics. No wild claims are made for the diagnostic or prognostic merits of the method; in fact, physicians are repeatedly warned that ballistic tracings constitute but one part of an examination and must be interpreted in the light of other findings. As with the electrocardiogram, normal records may accompany heart disease and vice versa. Unlike the electrocardiogram, a ballistocardiogram is related to ejection of blood from the heart and far exceeds the former in recording the pumping activity of that organ.

Among its many chapters, the volume includes those on techniques, interpretation, physiological relations, and the effects of cardiac and pulmonary diseases and of smoking on the records. The book is well illustrated, with a satisfactory index and bibliography. It is highly recommended to all medical physiologists and clinicians, and should be required reading for everyone with a ballistocardiograph.

**THE PSYCHOLOGY AND PSYCHOTHERAPY OF OTTO RANK—**Fay B. Karpf, Ph.D., Philosophical Library, New York, 1953. 129 pages, \$3.00.

The emergence and development of psychoanalysis as a psychotherapeutic technique attracted many disciples to the leadership of Sigmund Freud whose interest and energy and powerful personality won him vast prestige and the title "master." Among those early disciples were three fated to reject one or another or all of the master's foundation concepts which may be summarized as (1) the unconscious, (2) repression, (3) psychosexuality, (4) therapeutics, resistance and transference, insight interpretation, free association, and dream analysis. Freud later restated some of these to fit into his theories of ego, id, and superego.

The diversionists Jung and Adler were medically trained, and like Freud himself primarily concerned with psychoanalysis as a healing technique.

The third rebel, Otto Rank, was not medically trained, his preparation was varied, mathematics, logic, and the humanities with emphasis on anthropology providing most of his background. He accepted the biological slant that influenced his early work piecemeal from Freud, a fact that accounts for the very apparent contradictions in his teachings.

However, always he was more interested in the essential theoretic aspects of psychoanalysis than in therapy which he saw always as an educational technique used to help persons adjust by will and effort in the culture in which they must live. This point of view was greatly reinforced when Rank came to live among non-Germans in France and in the United States.

More and more he was revolted by what he considered cynicism and dogmatism of the Freudian gospel. Rank's teachings, however, have been influential in American social psychology and the thought of the present neo-Freudians.

Even Freud's concepts often show the effects of Rank's philosophy but when the disciple refutes the premise of the unconscious, the sexuality theories, and female inferiority, the break was inescapable and not to be healed. The bitter recrimination that followed the defection of Jung and Adler, however, was escaped.

This is a well organized, interestingly written book, is well worth reading by anyone concerned with the psychological approach to the problems of behavior.